CHAPTER I

MISSION AND ORGANIZATION

1985

The unit later known as the 6594th Test Group was activated on 1 November 1959. It was then called the 6594th Recovery Control Group and had two subordinate units--the 6593rd Test Squadron (Special) and the 6593rd Instrumentation Squadron. The mission of the Test Squadron was to develop and maintain a capability to effect the aerial recovery of a capsule ejected from an orbiting satellite, and that of the Instrumentation Squadron was to develop and maintain the capability to perform acquisition, tracking and command of satellite vehicles and readout of their instrumentation data (telemetry).[1] On 10 March 1966, the 6594th Recovery Control Group was redesignated as the 6594th Test Group, and on 1 July 1972, it was reorganized. In that reorganization, the Instrumentation Squadron was removed from the control of the Test Group and the Test Squadron was absorbed by the Group. From that point until its deactivation on 30 September 1986, the Test Group had a unicameral organizational structure and a single mission--to plan, direct, and execute the recovery of capsules ejected from space-orbiting satellites.[2]

The remainder of this chapter will describe how the mission of the Test Group originated and how that mission and the Test Group's method of accomplishing it evolved over the years. In so doing, it will concentrate exclusively on the recovery mission; the satellite tracking mission that the Group was responsible for while it controlled the Instrumentation Squadron will not be the focus of this history. The chapter will also describe in detail the activation of the Test Group and the Test Squadron and their

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DTIC - FDAB (AQ) (U91 -1016)
ATTN: Ms Joyce Chiras
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25 Mar 92

Dear Ms Chiras

This is in response to your 11 Oct 91 request for a copy of a report entitled "[redacted] Capsule Return Program" to be included in the Defense Technical Information Center Collection. Since your request was made on behalf of an unidentified third party DTIC user, we have responded as though this was a request made by a member of the general public under the Freedom of Information Act.

A determination has been made that the classified portions of the requested material are currently and properly classified. Release of this material could reasonably be expected to cause harm to the national security since it contains information that clearly fall within those areas protected by Executive Order 12356. Therefore, a sanitized version of this material has been prepared and is enclosed. The authority for withholding the classified portions is found at 5 U.S.C. 552(b)(1) and AFR 12-30, paragraph 10a.

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Secretary of the Air Force
THRU: HQ AFMC(I)/IMQD
Wright-Patterson AFB OH 45433-5001

The DTIC user should be furnished a copy of this letter. Any such appeal should include the requester's reasons for reconsideration, and attach a copy of this letter.

Sincerely

William E O'Brien

WILLIAM E. O'BRIEN
Colonel, USAF
Chief of Staff

file copy
OCC

organizational evolution over the years. In the process, it will touch on the relationship of the Group with higher headquarters and other units. The chapter will close by discussing the deactivation of the Group in 1986.

Mission

The mission of the 6594th Test Group--to recover capsules ejected from orbiting satellites--was first needed to support the Discoverer program in the late 1950's and early 1960's. Discoverer was a research and development program designed to "develop and prove the hardware, procedures and techniques necessary for a series of military satellite systems and to train the Air Force officers and airmen necessary to operate them."[3] The specific objectives of the program were defined as follows: 1) to consistently launch an earth satellite having an on-orbit weight of 1300 to 1800 pounds; 2) to consistently place such a satellite in a low altitude, near circular, polar orbit; 3) to stabilize this satellite on orbit, to re-position it at will, and to re-stabilize it in any desired attitude with respect to the earth; 4) to develop a tracking and communications network capable of precisely determining the orbital characteristics of the satellite, acquiring data from it, and issuing such commands as might be necessary to control it; 5) to separate a part of the vehicle--the recovery capsule--which could successfully re-enter the earth's atmosphere and which would carry a parachute, radar reflective chaff, a UHF radio homing beacon and a high intensity flashing light to aid in air and sea recovery; and 6) to develop an aerial recovery technique capable of air-snatching the capsule as it descended via parachute.[4]

To provide the needed recovery capability, a unit called the 6593rd Test Squadron (Special) was activated on 1 August 1958. (As we will see, this unit was later assigned to, and eventually absorbed by, the 6594th Test Group.) The Test Squadron flew C-119 transport planes out of Hickam AFB, Hawaii, and patrolled the recovery area towing trapeze-like frameworks designed to snatch the parachute harness of the descending capsule before it hit the water. However, the Test Squadron had to wait some time before it had a real opportunity to carry out a recovery. Of the first twelve Discoverer satellites, only seven were successfully placed into orbit, and of these, only five ejected capsules. One of the capsules landed near Spitzbergen, Norway, far from any recovery crews; two capsules failed to give out radio signals that would allow the recovery aircraft to locate them; and two others that did give out signals overshot the recovery area by several hundred miles and were lost. It was not until the Discoverer XIII capsule came down on 11 August 1960 that the Test Squadron actually had a chance to effect a recovery. The Test Squadron was not able to snag the capsule in mid-air, but it was able to locate it after it splashed down in the Pacific Ocean, and the capsule was recovered from the water by Navy personnel. This was the first successful recovery of a man-made object from space. The first successful aerial recovery came a few days later, on 19 August, when a C-119 commanded by Capt Harold E. Mitchell snagged the capsule from Discoverer XIV in mid-air. By February 1962, when the Discoverer Program ended, the Test Squadron had carried out seven more successful mid-air recoveries and assisted in three more surface (sea) recoveries.[5]

A description of a typical Discoverer mission will provide some

insight into how recovery was performed in those early days. The mission began when a Thor booster launched the satellite into a polar orbit from Vandenberg AFB, California. Reentry began after a minimum of 17 orbits. As the satellite passed over Alaska, gas jets pitched it to a position 60 degrees down from the horizontal, and a reentry vehicle was separated from the satellite by the action of explosive bolts and springs. Immediately after separation, a retro-rocket in the vehicle was fired to slow it down to re-entry velocity, and at an appropriate altitude, a parachute was released that slowed it still further. As the capsule descended, it was detected and tracked by tracking stations in Alaska and Hawaii, by two recovery ships (see below), and by RC-121D "flying radar stations" of the 552nd Airborne Early Warning and Control Wing of the Air Defense Command. The RC-121D's provided pick-up directions to the C-119s of the 6593rd Test Squadron as they patrolled the recovery area near the Hawaiian Islands. (The Test Squadron normally deployed nine C-119's during a mission.) The recovery aircraft located the descending capsule by homing in on a radio beacon attached to the recovery package and then sighting the parachute and capsule visually. To accomplish recovery, the aircraft used a trapeze-like mechanism made of nylon line and equipped with four-pronged grappling hooks. The mechanism was attached to the end of two long poles that extended in a V-configuration from the belly of the aircraft. The objective was to fly over the capsule, snag the parachute with the grappling hooks on the trapeze, and winch the parachute and capsule into the aircraft. The aircraft had about 10 minutes to make air recovery--the period during which the capsule and parachute passed through the aircraft's operational altitude.[6]

If air recovery could not be effected, surface recovery was attempted. The surface recovery force consisted of two converted World War II Victory ships--the USNS Longview and the USNS Sunnyvale. They were operated by the Navy, and each one carried two helicopters and a team of Scuba divers to assist in recovery. These recovery vessels were augmented by a third ship from the Pacific Fleet, also carrying helicopters and frogmen, and by several destroyers. In the first surface recovery--that of the Discoverer XIII capsule on 11 August 1960--a C-119 from the Test Squadron directed the USNS Haiti Victory carrying helicopters and frogmen to the scene. The frogmen jumped into the water and attached a line to the capsule, and it was winched up into one of the choppers. However, when the Discoverer XV capsule hit the water 1,000 miles south of the predicted impact point, naval vessels were unable to reach it before it sank. To prevent this from happening again, a new and faster surface recovery technique was devised and was employed in the next surface recovery--that of the Discoverer XXV capsule on 19 June 1961. An SC-54 Rescuemaster aircraft flew to the spot where the capsule had come down, and three para-rescuemen of the Air Rescue Service parachuted into the water, swam over to the capsule, inflated a raft, and secured the capsule to it. They remained in position until the next morning, when they and their cargo were picked up by the USS Radford. Both methods of surface recovery--recovery by helicopters operating off ships, and recovery by pararescue people jumping out of aircraft--continued in use. The first method constituted the primary method of recovery and the second method constituted the secondary, back-up method.[7]

The hardware and procedures used in recovery evolved a great deal

during the Test Squadron/Test Group's many years of activity. The various changes will be described in detail in Chapter III, but the most important will be summarized here to provide a overview and a framework for the rest of the history. The biggest change in the method of aerial recovery was the replacement of the C-119's with C-130's. The C-119's were really not adequate for the job; as the Recovery Control Group's first commander put it, they were two-engine aircraft flying in a four-engine ocean. The powerful C-130's had four engines, and they were able to fly twice as high as the C-119's, fly 100 miles an hour faster, and stay aloft almost three hours longer. The first of the C-130's was employed in a recovery mission on 14 September 1961, and within a month, all the C-119's in the recovery force had been replaced by C-130's.[8]

In addition to the change in the type of recovery aircraft employed, the number needed to patrol the recovery area was reduced. Two factors made this reduction possible. First, as time went by, the accuracy of the recovery capsules improved, reducing the area that had to be patrolled. Second, since the C-130's were faster than the C-119's, fewer aircraft could patrol a larger area. By 1964, the Test Squadron was using just five C-130's to patrol the recovery area, in place of the nine C-119's it had employed a few years before.[9]

The number of aircraft supporting the aerial recovery force was also reduced. As indicated above, the recovery aircraft were originally supported by RC-121D airborne radar planes that flew in from Sacramento for each mission. Experience showed that they were not needed and were even ineffective, and they were deleted from the recovery force. The available

documentation does not indicate precisely when this happened, but the "flying radar stations" were definitely out of the picture by 1966.[10]

While procedures for aerial recovery changed a good deal over the years, procedures for surface recovery changed even more. In October 1961, an Air Recovery Section (Helicopter) was established in the Test Squadron, and the Squadron acquired three H-21B helicopters. In December 1963, the H-21's were replaced by CH-3B helicopters that offered twin engine reliability, cruising airspeeds up to 130 knots, gross weights to 19,000 pounds, longer range (350 nautical miles vs. 200 nauticals miles), and an automatic navigation system. The Recovery Control Group's Operations Plan provided that the Test Squadron's helicopters would be utilized only when the recovery trace was sufficiently close to a suitable staging base (i.e., an island). In other words, the helicopters of the Test Squadron operated from land, and they supplemented rather than replaced the Navy helicopters that operated off the Longview and the Sunnyvale. Like the Navy helicopters, the Test Squadron's helicopters carried Scuba personnel who would jump into the water to assist in recovering the capsule.[11]

The next major change in surface recovery occurred on 1 February 1965, when the Western Test Range acquired the two surface recovery units--the Longview and the Sunnyvale. These ships were put under the operational control of the Recovery Control Group, and the Navy CH-34 helicopters that had previously operated off the ships were replaced with CH-3B helicopters belonging to the Test Squadron. This completed a long process whereby the Group took over control of surface recovery from the Navy. In the beginning, the Navy had supported surface recovery with ships and

helicopters. Then, the Test Squadron had acquired helicopters of its own and operated them from island staging points to augment the ships and helicopters of the Navy. Now, the Test Squadron was taking control of the ships and putting its own helicopters on them, leaving the Navy with no major role in surface recovery.[12]

Once the H-3 helicopters began operating off the ships, surface recovery was accomplished as follows. A helicopter arrived on the scene and hovered above the floating capsule, and Scuba divers jumped out of the helicopter into the water. A cable was lowered down from the helicopter, and the Scuba divers attached the cable to the capsule. The helicopter lifted the capsule out of the water and carried it back to the mother ship, still suspended by this cable. Once the helicopter had landed on the ship, the payload was raised up by a hoist, put on a platform, and loaded into the helicopter for transportation to land. The Scuba divers, meanwhile, had been picked up by another helicopter.[13]

The Scuba divers who were used with the H-21 and H-3 helicopters were not full-time Scuba specialists; they were people who spent most of their time doing other jobs for the Test Squadron but had taken some Scuba training and were performing the Scuba function as an additional duty. It proved difficult to maintain an adequate number of capable Scuba divers using this approach. On 31 March 1971, therefore, the unit manning document was changed to allow replacement of the Scuba divers with pararecovery specialists whose full-time job was jumping out of aircraft into the water.[14]

As the reader will recall, deployment of pararecovery personnel from helicopters was the primary method of carrying out surface recovery, but there was also a back-up method--to have pararecovery personnel parachute into the water from a fixed wing aircraft and secure the capsule for later pickup. Originally, the personnel used in the back-up method were supplied by the 76th Air Rescue and Recovery Squadron (ARRS) and were flown to the scene in an HC-130 owned and operated by the 76th ARRS. During 1971, however, plans were made to have the Test Squadron take over this function itself, and in 1972, a training program was established to train the Test Squadron's air crews in the techniques needed to deploy pararecovery specialists and associated equipment from their JC-130's. Once the training program was completed--apparently in 1973--the Test Group took over the entire secondary surface recovery function from the 76th ARRS. From that point on, the pararescue personnel used in the back-up method of surface recovery were assigned to the Test Squadron and were flown to the scene in one of the Squadron's own planes.[15]

The last major change in surface recovery occurred in 1973/74, when the C-3 helicopters and the ships were replaced by land-based HH-53 helicopters refueled in mid-air by C-130P tanker aircraft. The change was made because operation of the ships was very expensive, and the HH-53's, supported by the C-130P's, constituted a less costly alternative. The helicopter/tanker combination was also more responsive, since the HH-53's offered greater range, speed, and performance than did the C-3's. The Test Group received the third of three HC-130P tankers in January 1974 and six HH-53C helicopters during June and July 1974. In October 1974, two H-3 helicopters were returned to the Navy aboard the USNS Longview, and the last

Test Group H-3 helicopters left Hawaii aboard the USNS Sunnyvale in December 1974.[16]

Once the HH-53's were introduced, surface recovery was accomplished as follows. After the HH-53 arrived on the scene, two pararecovery specialists were dropped into the water, along with a flotation collar and sling harness. The pararecovery specialists fitted the harness to the capsule, the HH-53 lowered a winchline, and the pararecovery people attached the winchline to a lift ring on the harness. The capsule was then winched aboard the helicopter and transported to Hawaii. The winchline and other hardware that allowed the helicopter to perform surface recovery was called the Surface Recovery System (SRS). The SRS was designed by engineering people in the Test Group itself and built from off-the-shelf components by the Warner-Robbins Air Logistics Center. Warner-Robbins also modified the H-53's and installed the recovery systems in them.[17]

Just as recovery techniques evolved over time, the programs supported by these techniques changed as well. The Discoverer Program was succeeded by other programs

These included NASA's Biosatellite program, the Atomic Energy Commission's Project Ashcan, the Army's Designating Optical Tracker (DOT) program, and the Air Force's Advanced Ballistic Reentry Systems (ABRES) and Balloon Altitude Mosaic Measurements (BAMM) programs.

Support of these programs constituted a supplemental mission for the Test Group. Finally, the Test Group used its aircraft for search and rescue missions to find people lost at sea and to pick up sick or injured individuals from ships at sea and ferry them to hospitals in Hawaii. The search and rescue function took on greater importance after the Test Group acquired its long-range HH-53 helicopters and the 76th ARRS was deactivated, leaving the Test Group as the only organization in Hawaii with a long-range rescue capability.[19] It should be reemphasized, however, that the Test Group's primary mission--and the only one mentioned in its formal mission regulation--was the recovery of capsules ejected from orbiting satellites. Secondary functions like search and rescue and recovery of lower-priority payloads were conducted only to the extent that they did not interfere with the primary mission. Details on the programs supported by the Test Group can be found in Chapter IV (Operations).

Organization

Just as recovery techniques went through years of evolution before they matured, the Test Group itself went through changes in name and organizational structure. The Test Group was originally known as the 6594th Recovery Control Group, and it controlled two subordinate units--the 6593rd Instrumentation Squadron, which operated the tracking station at Kaena Point, Hawaii, and the 6593rd Test Squadron, which carried out recovery activities. As the years went by, the Recovery Control Group was redesignated as the 6594th Test Group, the Instrumentation Squadron was assigned to the Air Force Satellite Control Facility, and the Test Squadron was inactivated and its personnel and resources were absorbed by the Test

Group, all of which gave the Test Group the name and organizational structure that characterized it in its later years. Let us now examine in detail these changes in the designation and organizational structure of the Group.

The story actually begins, not with the creation of the Group itself, but with that of the Test Squadron, which was activated first. On 9 July 1958, the Air Research and Development Command (ARDC) was directed to form a provisional unit capable of operating nine C-119J aircraft for aerial recovery of deorbited space capsules. The Tactical Air Command (TAC) was tasked to provide the personnel for the unit and, together with ARDC, select a unit commander. From 16 to 19 July, representatives from ARDC and TAC met with representatives of the Air Force Ballistic Missile Division (AFBMD) to organize the new recovery unit, called the 6593rd Test Squadron (Special). TAC identified 133 highly qualified officer and enlisted personnel to man the unit and selected Major Joseph G. Nellor as its first commander. The Test Squadron was officially activated on 1 August 1958. The C-119 crews were initially sent TDY to Edwards AFB, California, for training. On or about 1 December 1958, they proceeded to Hickam AFB, Hawaii, which was their permanent station.[20]

The Test Squadron was originally assigned to HQ ARDC, but administrative and operational control was vested in AFBMD, a division of ARDC. The arrangement was changed on 22 June 1959, when operational control was transferred to the 6594th Test Wing--the forerunner of the Air Force Satellite Control Facility. It was changed again later that year when the Squadron was reassigned to the 6594th Recovery Control Group.[21]

The Recovery Control Group grew out of a Field Office that AFBMD set up in Hawaii in September 1958. The Field Office had a two-fold mission--to activate a tracking station at Kaena Point on the island of Oahua and to coordinate the activities of the 6593rd Test Squadron and the other organizations involved in the recovery effort. The Field Office was transformed into the 6594th Recovery Control Group on 1 November 1959, when the Group was designated and organized at Hickam AFB and assigned to the 6594th Test Wing. Lt Col Teuvo A. Ahola, who had commanded the Field Office, was named as the first commander of the Group. The Group inherited the mission of the Field Office--to coordinate operations and training of all recovery forces in Hawaii. The 6593rd Test Squadron was assigned to the Group effective 1 November 1959, and on the same date, the 6593rd Instrumentation Squadron was designated and organized and assigned to the Group. The mission of the Instrumentation Squadron was to operate the satellite tracking station at Kaena Point.[22]

Once the Test Squadron was assigned to the Recovery Control Group, the relationship between the two organizations was the following. The Test Squadron trained the aircrews for the C-119s and later the C-130's, and it flew the recovery missions. The Group laid on the missions and provided orders and direction. In addition, the Group Commander served as the Recovery Force Commander. The Recovery Force included elements outside the Group--e.g., elements of the Navy involved in surface recovery--and the Recovery Force Commander had operational control of those elements during a recovery.[23]

During the mid-1960's, the Recovery Control Group acquired

a new higher headquarters and a new name. On 1 July 1965, the Group was reassigned from the 6594th Test Wing, which was discontinued on that date, to the Air Force Satellite Control Facility (AFSCF), which was activated on that date. On 10 March 1966, the Recovery Control Group was redesignated as the 6594th Test Group--the name by which it was known throughout the remainder of its existence.[24]

The biggest organizational change in the Test Group's history occurred on 1 July 1972, when the 6593rd Instrumentation Squadron was reassigned from the Test Group to HQ AFSCF and the 6593rd Test Squadron was inactivated and its personnel and resources absorbed by the Test Group. Col William Quinn, who was Commander of the Test Group when this reorganization took place, laid out the reasons for it in an interview some years later. He pointed out that it was an anomaly to have the Instrumentation Squadron report to the Test Group, since the organizations that ran the other tracking stations reported directly to the AFSCF. If you ended that anomaly by assigning the Instrumentation Squadron to the AFSCF, that left the Test Group with just one subordinate unit. That suggested the obvious step of saving some manpower by merging the Test Squadron into the Test Group. Saving manpower was appropriate and even necessary since the Air Force was going through a manpower reduction at the time.[25]

The final major organizational change affecting the Test Group involved AFSCF Operating Location No. 1 (OL-1) at Edwards AFB, California. The mission of OL-1 was to test and evaluate new or modified satellite recovery parachutes and new or modified C-130 recovery equipment. By 1973, the workload of OL-1 was declining and the decline was expected to

continue. The workload of the Test Group, on the other hand, had been increasing and, again, the increase was expected to continue. The AFSCF performed an extensive study which determined that the two operations could be merged and significant savings could be realized without sacrificing mission effectiveness. The merger was accomplished during the first half of CY 1973, when the personnel and equipment of OL-1 were transferred from Edwards AFB to Hickam AFB. The merger allowed the AFSCF to turn in one C-130 aircraft, release 12 associated manpower authorizations, and achieve an annual savings of some $400,000.[26]

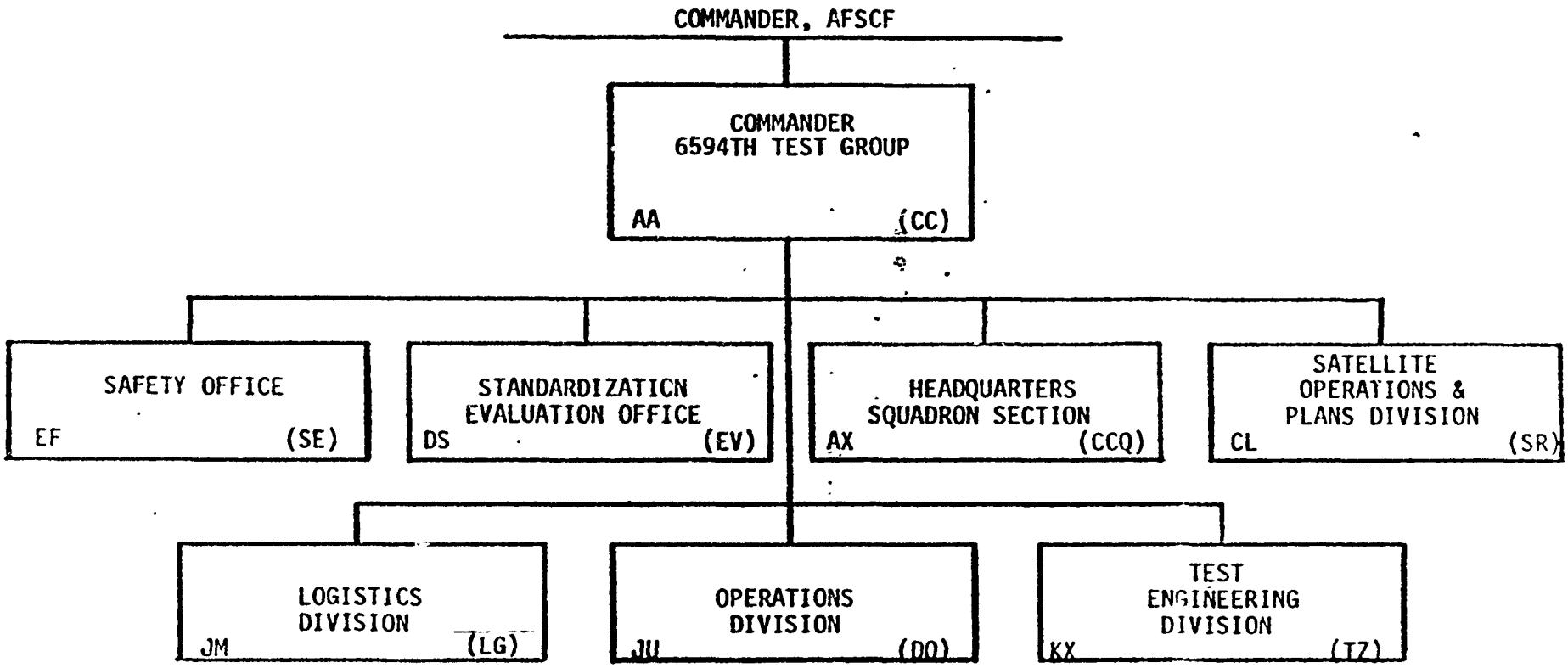
With the consolidation of the Test Group and OL-1, the Test Group attained its "mature" organizational configuration. Recovery operations and test and evaluation of recovery equipment and parachutes were consolidated in one unit--the Test Group itself--and that unit had divested itself of the 6593rd Instrumentation Squadron and its separate mission. There was a simplicity to the organization and a unity to the mission that manifested a commendable logic.

This discussion of organizational changes has focused on the activation, deactivation, assignment and reassignment of units. It has not focused on changes within units--the realignment of divisions and offices within the Test Squadron and the Test Group. Documentation on these internal organizational changes is incomplete, since many of the organization charts originally issued for the Test Squadron and the Test Group are no longer available. (Those that do survive can be found in appendices in the back of this history.) In addition, a lengthy discussion of numerous internal organizational changes would be inappropriate in a

short, overview history of this nature. However, it would be useful--and contribute to an understanding of the material presented in the rest of this history--to provide a snapshot of the internal organization that prevailed in the Group in the late 1970's, after its "external" organization reached maturity.

The chart on the following page shows how the Test Group was organized on 1 June 1979. The major functional elements were the four divisions--Test Engineering (TZ), Satellite Operations and Plans (SR), Logistics (LG), and Operations (DO). The Test Engineering Division tested and evaluated recovery equipment and developed and recommended techniques and procedures to be used with recoverable systems. The Satellite Operations and Plans Division played a role similar to that of a Plans shop in a more conventional unit. It received a mission tasking, determined what was needed to carry it out, made appropriate preparations with all agencies involved, and critiqued the Group's performance on each mission and recorded any lessons learned. This division also insured complete operational and functionally suitable communications capability for each mission, to include radio, teletype, and closed circuit television capability. The Logistics Division was responsible for carrying out all Test Group logistics functions, including maintenance, supply, logistics plans, transportation, contracting, civil engineering, and management of comptroller functions. Finally, the Operations Division flew the Group's aircraft--C-130 fixed wing aircraft and HH-53C helicopters--and carried out recoveries during both operational and training missions. We can sum all this up by saying that the Test Engineering Division tested recovery equipment and developed techniques and procedures for using it; the Satellite Operations and Plans

1 June 1979


COMMANDER, AFSCF
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HEADQUARTERS
SQUADRON SECTION
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OPERATIONS &
PLANS DIVISION
CL (SR)
LOGISTICS
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JM (LG)
OPERATIONS
DIVISION
JU (DO)
TEST
ENGINEERING
DIVISION
KX (TZ)

Division laid plans for supporting customers' programs and carrying out recovery missions; the Logistics Division maintained the aircraft and equipment that would be used in those missions; and the Operations Division flew the aircraft and made the recoveries.[27]

The Test Group, competent though it was, could not do everything for itself and depended on certain other organizations for support. First and foremost of these was the organization to which the Group belonged--the Air Force Satellite Control Facility (AFSCF). The AFSCF carried out three functions vital to the Test Group. First, it managed the development and improvement of the hardware that the Test Group needed for retrieval of space reentry vehicles (capsules). Second, the AFSCF controlled military satellites in orbit, including those that generated the capsules recovered by the Test Group. The AFSCF tracked the position of each satellite continuously and sent commands to it that caused the satellite to deorbit and caused the reentry capsule to separate from the satellite and descend toward the earth. Third, the AFSCF was involved in the recovery itself. It provided the Test Group with the time of deorbit; the time and location of recovery, including revised impact predictions; and general instructions on the movement of recovery forces. Deployment and control of recovery forces during operations and search was the responsibility of the Test Group itself, which directed those forces from the Recovery Control Center (RCC) at Hickam AFB.[28]

In addition to the support provided by higher headquarters, the Test Group also received support from the unit that ran the host base. This organization was originally known as the 6486th Air Base Wing (ABW) but was

later redesignated as the 15th ABW. When the 6593rd Test Squadron and the 6594th Recovery Control Group were organized, they were attached to the Air Base Wing for administrative and logistic support, and this arrangement remained in effect until the 6594th Test Group was deactivated.[29] However, there were some changes in the relationship over the 28 year period, and perhaps the most important was in the area of maintenance.

Originally, the Test Squadron was responsible for maintaining the aerial recovery equipment and for doing flight-line maintenance on its aircraft, while units of the Air Base Wing were responsible for periodic inspections of the aircraft and for field maintenance done in shops rather than on the flightline. In February-March 1967, however, Air Force Systems Command conducted a special inspection of the Test Group's aircraft maintenance and quality control functions. The inspection showcased some problems that were attributed to the unsatisfactory division of responsibilities between the host base and the Test Group. An agreement was therefore negotiated with the host base whereby all organizational maintenance and associated Chief of Maintenance functions, as defined in AFM 66-1, would be the responsibility of the Test Group. Accordingly, during the first half of 1968, the Chief of Maintenance and the Periodic Inspection functions were transferred from 6486th ABW units to the 6593rd Test Squadron. This transfer involved 55 manpower authorizations and 28 assigned personnel. It left the Test Squadron responsible for flightline maintenance and periodic inspection of the aircraft and the Air Base Wing responsible for field maintenance done in shops.[30]

(U) Another organization that supported the Test Group was the Air

Rescue Service (ARS), later called the Aerospace Rescue and Recovery Service (ARRS). As we saw in the Mission section of this chapter, the ARS played an important role in surface recovery for a number of years until the Test Group took over that role itself. However, the ARS also posed a threat to the Group, because it made many attempts over the years to gain control of the Group and its mission. Allied to the ARS was its parent command, the Military Air Transport Service (MATS), later called the Military Airlift Command (MAC). Opposing the efforts of MAC and the ARS were--in ascending hierarchical order--the 6593rd Test Squadron; the 6594th Recovery Control Group, later called the 6594th Test Group; the 6594th Test Wing, which was succeeded by the Air Force Satellite Control Facility (AFSCF); the Space Systems Division (SSD), which was succeeded by the Space and Missile Systems Organization (SAMSO); and the Air Force Systems Command (AFSC).

Struggle for Control of the Test Group

The seeds of this turf contest were planted in October 1961, when a mission regulation was published for the ARS. The regulation, initially called AFR 20-54 and later called AFR 23-19, said that the ARS was to search for, locate, and recover personnel and/or aerospace hardware in support of Air Force global air and space operations, including research and development. HQ USAF drew the logical conclusion and proposed the transfer of the 6593rd Test Squadron (and its mission) to the ARS. Space Systems Division rebutted this proposal and received a waiver to the provisions of AFR 20-54 for programs involving the Recovery Control Group. The waiver was granted in August 1962 and was extended in December 1963. However, the long-range objective that ARS develop the capability to satisfy all global

air and space recovery requirements remained in effect.[31]

That objective was still in effect in 1966, but by that time a total of five different commands were carrying out recovery activities. To resolve this tension between goal and reality, the Vice Chief of Staff of the Air Force asked for a detailed review of recovery activites being conducted by the major commands. The Vice Chief's request generated a study called "Yellow Duck," conducted by the Directorate of Studies and Analysis in the Deputy Chief of Staff for Plans and Operations. The study concluded that none of the recovery functions being performed by the various major commands should be reassigned unless major changes in mission, requirements, or equipment occurred. The authors of the study noted that single-purpose, specialized equipment was required for a number of these recovery programs and that the programs themselves were quite dissimilar. They found no evidence that reassigning these dissimilar programs with their specialized equipment to a single agency would increase effectiveness and economy. Rather, they felt that these projects had been, and could be, conducted more efficiently without such consolidation.[32]

Following the Yellow Duck study, the issue remained submerged for several years, but in 1970 it surfaced again. On 10 January of that year, Gen Catton, Commander of MAC, wrote a letter to Gen Meyer, Vice Chief of Staff of the Air Force, requesting that the 6594th Test Group mission be assigned to the ARRS. He argued that the mission of the Test Group had become routinely operational, that the ARRS was well postured to perform it, and that transfer of the mission to the ARRS would produce savings in both money and manpower. In respone to this request, Gen Meyer directed an

update of the "Yellow Duck" study. The update was supposed to be accomplished jointly by MAC and AFSC, but the two commands could not agree on the ground rules to be followed, and they prepared and forwarded separate studies outlining their individual viewpoints. The MAC/ARRS study concluded that consolidation of the hardware recovery mission under a single agency (Hq MAC/ARRS) would be feasible and cost effective. The AFSC study concluded, on the other hand, that the specialized recovery functions performed by the Test Group should remain under AFSC control. "From the AFSC standpoint," the study said, "the 6594th Test Group is involved in research and development effort. . . . None of the direct mission supporting hardware, be it the spacecraft itself, the supporting ground tracking equipment, decelerators, recovery aircraft equipment, reentry vehicles or satellite test center control equipment, has reached the point of configuration stability where it can be transitioned to AFLC [Air Force Logistics Command] for support as is normally done for operational hardware. The recovery mission has been conducted by AFSC utilizing time proven, streamlined, test direction and control techniques, integrating all elements of the test organization--research and development program office, Director of Test Operations (AFSCF), Recovery Control Center, and 6593rd Test Squadron--into a smoothly functioning and exceptionally successful effort." In other words, the Test Group was engaged in research and development activity rather than operational activity, and the existing management structure was working well and should not be changed.[33]

On 30 July 1970, General Meyer directed that the mission and resources of the 6594th Test Group remain with AFSC. His rationale was that the programs supported by the 6594th Test Group were not routinely

operational, that the needs of these programs did not permit changes in the method and level of support being provided by the 6594th, that neither money nor manpower savings could be realized unless support capability were reduced, and that in light of all this, there was no advantage to assigning the mission and resources of the Test Group to the ARRS.[34]

In April 1971, the ARRS produced a study laying out its projected requirements for the 1970's, and the study argued that the ARRS should take over the mission of the 6594th Test Group. In response, AFSC sent a message to MAC, pointing out that recovery functions had been subjected to continual and comprehensive analysis, that the last study had been done in May 1970, and that no new or compelling information had been found to justify reopening the subject. In addition, Gen Brown, AFSC Commander, sent a letter to Gen Meyer, strongly opposing transfer of the Test Group's recovery mission to MAC/ARRS. On 12 July, Gen Meyer wrote to the Under Secretary of the Air Force stating that he had found the AFSC position convincing and had decided to reaffirm his decision of the previous year--that the Test Squadron's recovery function should remain under AFSC.[35]

A few months later, AFSC proposed to HQ USAF that the ships and CH-3B helicopters then used for surface recovery be replaced with HC-130 tanker aircraft and air-refuelable HH-53 helicopters. This prompted MAC to bring up the roles and mission question again. On 27 January 1972, Gen Catton wrote a letter to AFSC saying that if it was decided to accomplish the water recovery mission with HC-130 tankers and HH-53 helicopters and if AFSC retained responsibility for this mission, the resources would have to come from the ARRS. On the other hand, he said, if the mission were given

to the ARRS, the ARRS forces could be "dual utilized" and the mission could be performed just as effectively but with fewer USAF resources. Catton seemed willing to let AFSC retain the air-recovery function, but he wanted to meet with Gen Brown to discuss transfer of the surface recovery function to MAC/ARRS. This would, he said, preserve the ARRS global search and rescue capability and save money for the Air Force. General Brown wrote back on 9 February 1972. "Regarding the mission of the 6594th Test Group at Hickam," he said, "I am sure you are aware of the many times this issue has been raised. The advantages and disadvantages have been discussed at great length, the last time being in July 1971. One very important consideration turns on the matter of mission priority. Under existing rules, whenever a recovery operation is underway, no other mission can take priority--not even a rescue mission.... The potential conflict in mission priorities... weighs heavily in favor of retaining the present organizational arrangements." In light of all this, General Brown concluded, there was nothing to be gained by reopening the issue at that time.[36]

In March 1973, HQ USAF set up a study group, headed by Brig Gen Clyde R. Denniston, to evaluate AFSC's request to replace the Test Group's ships and H-3's with C-130 tankers and HH-53's. MAC was still lobbying to have the Test Group's mission assigned to the ARRS, and the study group took up that issue also. One member of the study group argued that management overhead could be reduced and economies realized if the surface recovery part of the Test Group mission were transferred to MAC/ARRS. Gen Denniston subsequently rejected this argument when it was determined that MAC/ARRS did not actually have a search and rescue mission at Hickam and that plans were being laid to deactivate its 41st ARR Wing at Hickam. Gen Denniston

recommended that the surface recovery mission be retained by AFSC and that the Test Group be allowed to replace its ships and H-3's with C-130 tankers and HH-53's. Both recommendations were accepted by HQ USAF.[37]

Undeterred by this rebuff, MAC raised the issure again in 1974. The new MAC Commander, Gen Paul K. Carlton, conveyed to the new Commander of AFSC, Gen Samuel C. Phillips, his desire to consolidate all potential search and rescue resources in the ARRS so as to retain a viable combat rescue capability. Gen Phillips sent back a polite letter saying that this desire was understandable but that a combat rescue mission--which the Test Group would have gotten if it had been reassigned to the ARRS--was incompatible with the Test Group's recovery mission.[38]

The Test Group controversy was quiescent in 1975 but became active again in 1976. Gen Carlton sent a letter to Gen William J. Evans, now Commander of AFSC, proposing that the Test Group be reassigned to the ARRS. ". . . It would appear that the 6594th now performs primarily an operational rather than a test mission," he said. "Since hardware recovery is within the purview of the ARRS mission as specified in AFM 2-36, I believe it appropriate and timely to address the transfer of this unit to ARRS. As I'm sure you know, we have previously proposed this transfer to your predecessor and have not been successful. However, I believe that with the current climate of austerity, the time is right to resurface the proposal." Carlton then tried to demonstrate that the transfer would produce benefits in many different areas--e.g., aircrew career progression, training, pararescue manning, logistics, weather reconnaissance support, aircrew standardization, and search and rescue capability. In his reply, Gen Evans reiterated the

position taken by his predecessors. "We believe that the conclusions of the six previous Air Staff studies are still valid - and that the 6594th should remain assigned to AFSC. Any operational advantages that might accrue from the transfer would be more than offset by the disadvantages inherent in fragmenting the highly efficient command, control and communications attendant with a single organazation (SAMSO) performing satellite development, launch, operations and recovery."[39]

Gen Carlton's initiative of 1976 was MAC's last attempt to pry the 6594th and its mission away from AFSC. During the long turf contest, MAC had argued that the mission of recovering aerospace hardware belonged to ARRS, as stated in its mission regulation, and that reassigning the Test Group and its recovery function to the ARRS would eliminate duplication and promote economy and efficiency. MAC had also claimed that by 1970, recovery operations carried out by the Group had become routinely operational in nature and should be carried out by an operational (rather than an R&D) command. AFSC, on the other hand, claimed that even in the 1970's, there was a significant level of R&D activity involved in recovery operations and they were not routinely operational. AFSC had also maintained that recovery operations were being conducted efficiently from a cost and management standpoint and that no significant cost savings would be achieved by transferring the Test Group and its recovery function to another command. It had also pointed out that under the existing management arrangements, all activities pertaining to military satellites--from launch through on-orbit control to recovery--were conducted by one organization (SAMSO), and it had urged that this unity of command and ease of management should be maintained. Finally, AFSC had continually emphasized the danger of

assigning the Test Group, with its high priority mission, to an organization that had another mission (search and rescue) that could compete for use of the Group's resources. Having heard these arguments over and over again, HQ USAF consistently sided with AFSC and consistently refused to reassign the Test Group and its mission to MAC.[40]

Drawdown and Deactivation

Just as the need to recover reentry capsules had led to the activation of the Test Squadron and the Recovery Control Group back in the late 1950's, the diminution and eventual disappearance of that requirement led to the drawdown and deactivation of the Test Group in the 1980's.

It had a fleet of 21 aircraft--nine JC-130B recovery aircraft, three JC-130H recovery aircraft, three HC-130P tanker aircraft, and six HH-53C helicopters. To support an individual recovery operation, it needed to put seven JC-130 aircraft into the air--four to carry out recovery, one to back them up (as a flying spare), one to perform weather reconnaisance, and one to collect telemetry uprange. With these aircraft, it covered a box-shaped area that was 32 nautical miles wide and varied in length from 150 nautical miles
to 223 nautical miles

Initially, it looked at the possibility of scrapping the aerial recovery force altogether and performing all recoveries with a surface recovery force. However, this option was rejected, and it was decided instead to retain the aerial recovery force but to reduce it in size. Accordingly, the Test Group gave up two of its JC-130B aircraft, and in a related action, the Group's manning was reduced by approximately 36 aircrew personnel. On 14 September 1984, a new Operations Plan went into effect, reflecting the aircraft reduction. It provided that recovery missions would be supported by just five JC-130 aircraft--two to carry out recovery, one to back them up (as a flying spare), one to perform weather reconnaisance, and one to collect telemetry uprange. In other words, the Test Group would put five planes in the air instead of seven and would assign just two to perform the recovery, instead of four. Furthermore, these aircraft would patrol a smaller recovery area.

It was apparently in 1979 that AFSC received its first inkling that the curtain would be coming down.

The Test Group then began preparing an Implementation Plan for the deactivation, and the Plan was published by HQ AFSC on 1 March 1985. Shortly thereafter, the Group created a special office--the Office of Resource Management--to direct and control the orderly accomplishment of the Plan.[43]

The challenge involved in deactivating the Group was to maintain its operational capability through 31 March 1987 while at the same time arranging for the transfer of all its resources to other elements of the Air Force by 30 June 1987. These resources included facilities, people, aircraft, equipment, and supplies. The hardest problems to work were those involving people and aircraft.

The aircraft could not be turned over to their new owners in their existing condition. The HH-53's, the JC-130B's, and the JC-130H's had been specially modified for use in recovery, and each one had to be demodified and returned to standard configuration, unless the gaining unit accepted the aircraft in its modified configuration. The Test Group itself was to remove Class 1 and Class 2 modifications from the aircraft; Class 5 modifications were to be removed by the Warner-Robbins Air Logistics Center (ALC). The JC-130's required 5,000 hours each for removal of Class 5 modifications and the HH-53's required 2500 hours each for the same process.[44]

By August 1985, the Test Group had learned where some of its

aircraft would go. Three HC-130P's, two JC-130H's, and five HH-53's would go to MAC, and one JC-130H would go to the 6514th Test Squadron at Hill AFB, Utah. The following month, the Test Group was informed that four of its JC-130B's would be assigned to the Air Force Reserve and the remaining three to the Air National Guard. All these aircraft were to be retained by the Group until its primary mission terminated. Then, within the next three months, the HC-130P's were to be delivered to Kirtland AFB, New Mexico, for subsequent redistribution within MAC. The HH-53's, the JC-130B's, and two of the JC-130H's were to be delivered to Warner-Robbins ALC for Class V demodification and subsequent redistribution to the gaining organizations. The one remaining JC-130H was to be delivered to the 6514th Test Squadron at Hill AFB. (This was the one recovery aircraft that would remain in its modified configuration.) The HH-53's were to be shipped to Warner-Robbins in C-5's. The C-130's were to be ferried to their various destinations by aircrews from the Test Group itself, and this assignment would be their last before leaving the unit.[45]

Personnel issues were perhaps even more challenging than aircraft issues. During the period before deactivation, it was necessary to regulate the arrival and departure of personnel in such a way that the Group would maintain an adequate number of people to accomplish its mission and those people would have an adequate level of experience. As far as numbers were concerned, the Implementation Plan identified the minimum number of people that would be needed to perform the various functions within the Group (C-130 operations, HH-53 operations, etc.) until the Group's mission was terminated. To maintain experience at an adequate level, assignment of incoming personnel would be terminated between 24 and 30 months before

deactivation--the exact date varied from one job category to another--and the assignments of people already on board would be extended as needed. The Group didn't want to be saddled with people who would arrive shortly before deactivation and wouldn't become proficient in their jobs until the unit was ready to go out of business.[46]

Once the Group was deactivated, it would be necessary to reassign all its remaining personnel to other units. In deciding where the people would go, many factors had to be considered, including the needs of the command (AFSC) and the desires of the individuals themselves. It was therefore necessary to identify those officers and airmen from the Group whose expertise should be retained within the command, as well as positions within the command to which they might be reassigned. It was also necessary to communicate the desires of the Group's personnel to the Air Force Military Personnel Center and to protect them, to the extent possible, from any negative impact resulting from the deactivation. Most aircrew members were to be reassigned to other C-130 and HH-53 units, and most of the Group's personnel would report to their new units two months after the Group's mission disappeared. Early reporting would be authorized, however, and the Group commander would control the actual departure dates based on mission needs.[47]

It should be noted that these plans were formulated with the help of the Air Force Military Personnel Center (AFMPC). To obtain that help, a delegation from the Test Group, augmented by representatives from AFSC and the AFSCF, travelled to AFMPC and met with resource managers there on 14-15 November 1984. The meeting produced agreement on important personnel

issues. For example, specific manning levels for several job categories (AFSCs) were established, and policy regarding tour extensions, tour completions, and follow-on tours was agreed on. Several months later, on 4-11 May 1985, a three-man team from the Group made a follow-up visit to AFMPC for further discussion of manpower/personnel issues. Following the trip, the leader of the team expressed the opinion that "personnel-wise, we're pretty much squared away now." Implementation of the game plan appeared to run smoothly for the most part. For example, the Test Group requested extensions for a dozen of its personnel on 10 July 1985, and AFMPC granted all of them the following month. One significant issue did remain, however; the Test Group wanted a joint Personnel Assistance Team from AFSC and AFMPC to visit the Group to provide briefings and counseling. AFSC and AFMPC were slow in scheduling this visit, and the Group sent out several arm-waving messages on the subject. A team eventually visited the Group 24-28 February 1986, providing briefings on assignment policies and opportunities and holding invidual counseling sessions.[48]

The deactivation of the Group was to affect not only military personnel but civilian employees as well. These included 19 civilians who worked for the Test Group itself and 133 more who worked for the Air Base Wing and supported the Group, either in aircraft maintenance or in base operating support. Their positions were to be abolished as a result of the deactivation, and the employees would become surplus. The Civilian Personnel Office in the 15th ABW planned to stockpile vacancies in other organizations at Hickam into which surplus employees could be placed once the Group was deactivated. Even so, the Civilian Personnel Office still expected that 50 or 60 employees would have to be separated through

reduction in force (RIF) between the fourth quarter of FY 1986 and the fourth quarter of FY 1987. (Not all of these separations would result from the deactivation of the Group; in addition to the 152 authorizations that would be lost due to the deactivation, another 53 authorizations were being lost at Hickam for other reasons.) In an effort to help employees who were separated, the Civilian Personnel Office planned to take the following actions: 1) make maximum use of the DOD Priority Placement Program, the Displaced Employee Program, and the Reemployment Priority List; 2) notify the Office of Personnel Management and other federal agencies of the numbers and skills of employees being separated and work closely with those agencies in soliciting employment consideration for affected employees; 3) contact state and local government offices to solicit placement assistance and determine if affected employees were eligible for training at government expense; and 4) notify private employers of surplus skills available and ask them to provide employment consideration.[49]

Following public disclosure of the shutdown, preparations for deactivation shifted into high gear. The Air Force Military Personnel Center sent a second personnel assistance team to Hickam in June 1987, and the Consolidated Base Personnel Office took on the job of processing 520 military personnel for departure. The Civilian Personnel Office handed out notices of separation to 59 civilian employees, but it was later able to extend job offers to all of them, and no civilians were actually separated because of the deactivation of the Group. A Supply and Maintenance Team came TDY from HQ AFSC with the authority to redistribute all material assets including communications equipment. Thanks in large part to their help, material assets were turned in ahead of time, and there was no loss of accountable equipment and probably no loss of non-accountable equipment and supplies, either. The plan for disposing of the Group's aircraft was modified in one respect; the 6514th Test Squadron at Hill AFB, Utah, got one of the JC-130B's originally allocated to the AF National Guard. In all other respects, the plan was followed. The HH-53's completed their flying the last week on June, and the last C-130 departed on 22 July. The 6594th Test Group was deactivated, as scheduled, on 30 September 1986.[53]

The Record of the Group

As the Test Group disbanded, its personnel had every reason to look back with pride. During the many years of their existence, the 6593rd Test Squadron and the 6594th Test Group had compiled an outstanding record, reflected by the many awards won by the two units. In 1960 the Test Squadron had won the MacKay Trophy for making the first aerial recovery of a capsule ejected from an orbiting satellite. (The MacKay Trophy is given for the most meritorious flight of the year.) In addition, the Test Squadron, the Recovery Control Group, and the Test Group had received a total of thirteen Air Force Outstanding Unit Awards. A complete list of these awards is presented in an appendix at the end of this history.[54]

The Group was able to achieve such an outstanding record due to the high morale and great professionalism that characterized its personnel over the years. Col William Quinn, a former commander of the Group, speculated on the reasons for the high morale during an interview in 1985. "We were very, very busy. We knew we had an important mission. We had tremendous support. . . . Virtually anything we wanted, any supplies or maintenance . . . if they had it, we got it. . . . And the people had the feeling they were an elite group; they were doing a super important job. They were working their tannies off, but . . . it was great. Morale was good."[55] Speaking for himself, Quinn stated that his assignment as Test Group Commander was "probably the best assignment, the most enjoyable assignment, the most satisfying assignment that I had in the Air Force. You really thought you were something."[56]

NOTES TO CHAPTER ONE

1. Hist (U), 6894 Recovery Control Group, Jan-Jun 1961, p. 2 and atchs 2-4.

2. AFSCF Regulation 23-1 (U), "Organization and Mission - Field: 6594th Test Group," 19 Jul 1978 (Doc I-1).

3. News Release No. 61-15 (U), AFBMD/OI, "The Discoverer Story," undated (Doc I-2).

4. Paper (U), "Background Information: Project Discoverer," no author and no date (Doc I-3).

5. ARDC GO No. 58, 22 Jul 1958; Reginald Turnill, The Observer's Spaceflight Directory (London: Frederick Warne, Ltd., 1978), p. 141; Untitled, undated account of the recovery of the Discoverer XIV capsule (U), by Capt Harold E. Mitchell as told to Robert Cahn (Doc I-4); News Release No. 63-74 (U), SSD/OI, "Air Force Recovery Squadron Wins Award," 29 Jul 1963 (Doc I-5).

6. Discoverer III Fact Sheet (U), no author and no date (Doc I-6); Turnill, Spaceflight Directory, p. 141; News Release No. 61-17A (U), AFBMD/OI, "Discoverer XX Fact Sheet," no date (Doc I-7); William E. Burrows, Deep Black (New York: Random House, 1986), p. 110; Untitled, undated account of the recovery of the Discoverer XIV capsule (U), by Capt Harold E. Mitchell as told to Robert Cahn (Doc I-4); Hist (U), 6593 Test Sqdn, Jul-Dec 60, pp. 6-10; Hist (U), 6594 Recovery Control Group, Jul-Dec 60, pp. 3-4; Caption (U), for a still photo of the Discoverer XXV Recovery (no author/no date); Caption (U), for a film clip of the Discoverer XXV capsule recovery (no author/no date); Photo film script (U), for Discoverer XXIX Recovery (no author/no date); News Release (U), on the recovery of Discoverer XXXVI, 16 Dec 1961; Intvw (S), T.C. Hanley, Historian, with Col Teuvo A. Ahola, USAF (Ret), 8 Aug 1985.

7. See note above.

8. Intvw (S), T.C. Hanley, Historian, with Col Teuvo A. Ahola, USAF (Ret), 8 Aug 1985; AF News Release (U), "Discoverer C-130 Story," 2 Mar 1961 (Doc I-8); News Release No. 63-74 (U), SSD/OI, "Air Force Recovery Squadron Wins Award," 29 Jul 1963 (Doc I-5); Hist (U), 6593 Test Sqdn, Jul-Dec 1961, p. 3; Hist (U), 6594 Recovery Control Group, Jul-Dec 1961, p. 4. The Aerial Recovery Set (ARS) used in the C-130's during the mid-1970's was configured as follows: "Essentially, the ARS consisted of (1) an extension to the normal C-130 oxygen and interphone system to support the recovery crew complement, (2) the Model 90B Constant Tension Aerial Recovery Winch, (3) the aerial recovery dolly, (4) the electronic direction finder (EDF) and telemetry (TLM) equipment rack, and (5) the aircraft photographic recording system. That portion of the ARS known as the aerial recovery dolly included a series of scientifically designed loops which were strung between two 34-foot long recovery poles which extended approximately 20 feet from the aircraft's open back door. Attached to these loops were recovery hooks designed with four prongs which approximated the shape of a small boat anchor. The loops were attached to a winch line which wrapped around a

spool on the Model 90B winch. The winch pulled the loops and entangled parachute into the aircraft following initial contact of the descending system by the recovery loops." (Hist (S/DECL 31 Dec 07), AFSCF, FY 1975, pp. 129-130.)

9. Intvw (S), MSgt Frederick Vater, Historian, with Col William M. Quinn, USAF (Ret), 31 Jul 1985; News Release No. 63-74 (U), SSD/OI, "Air Force Recovery Squadron Wins Award," 29 Jul 1963 (Doc I-5); Paper (C/DECL 31 Dec 94), no author given, "White Paper in Rebuttal to the Proposed Transfer of the JC-130B Recovery Aircraft of the Air Force Systems Command to the Air Rescue Service," Mar 1964.

10. Intvw (S), T.C. Hanley, Historian, with Col Teuvo A. Ahola, USAF (Ret), 8 Aug 1985; Extracts from Test Group OPLAN 1-66, reproduced in Vol II of Study (C/OADR), HQ USAF/DCS Plans and Ops, "Yellow Duck: An Analysis of Air Force Aerospace Rescue and Recovery Activities," 20 Sep 1966. The RC-121D's were supposed to perform three functions while they supported the recovery program. Their long range radar was used to detect the capsule and provide pick-up directions; they provided a communications link between the ground recovery control center and the recovery aircraft; and they prevented a traffic jam inside the "ball park" by controlling the location of each recovery aircraft. (News Release No. 61-17A, AFBMD/OI, "Discoverer XX Fact Sheet," no date (Doc I-7).

11. Hist (U), 6593 Test Sqdn, Jul-Dec 61, pp. 15-17, and Jul-Dec 63, pp. 7-8 and 12; Hist (U), 6594 Recovery Control Group, Jul-Dec 61, p. 2, Jan-Jun 63, pp. 7-8, and Jul-Dec 63, p. 12; Chronology (U), 6594 Test Group, 1958-1983 (Doc I-9).

12. Hist (U), 6594 Recovery Control Group, Jan-Jun 65, p. 10; Hist (U), 6593 Test Sqdn, Jan-Jun 65, p. 5. It should be noted that while the two ships were placed under the operational control of the Recovery Control Group, the Navy continued to provide crews for the ships. (Intvw (S), T.C. Hanley, Historian, with MSgt Richard A. Blankenship, 6594TG/SRE, 31 Jul 1985.)

13. Intvws (U), T.C. Hanley, Historian, with MSgt Richard A. Blankenship, 6594 TG/SRE, Jul-Aug 1985.

14. Intvw (S), T.C. Hanley, Historian, with MSgt Richard A. Blankenship, 6594TG/SRE, 31 Jul 1985; Hist (U), 6594 Test Group, Jan-Jun 1971, p. 5.

15. Intvw (S), MSgt Frederick Vater, Historian, with Col William M. Quinn, USAF (Ret), 31 Jul 1985; Hist (U), 6594 Test Group, Jan-Jun 71, pp. 5 and 16, Jul-Dec 71, p. 5, and Jan-Jun 72, p. 11; Hist (U), 6593 Test Sqdn. Jan-Jun 72, p. 5. The 76th ARRS belonged to the Military Airlift Command (MAC), and MAC unsuccessfully resisted the idea of having the 76th ARRS stripped of its recovery support function. Supporting the Test Group had been a major mission for the 76th ARRS, and when it lost that mission, it lost a good part of its reason for being. Apparently because of this, the 76th ARRS was deactivated during the first half of 1975. (Intvw (S), MSgt Frederick Vater, Historian, with Col William M. Quinn, USAF (Ret), 31 Jul 1985; Hist (U), 6594 Test Group, Jan-Jun 75, p. 10.)

16. Hist (U), 6594 Test Group, Jul-Dec 73, p. 2, Jan-Jun 74, pp. 3-5, and Jul-Dec 74, pp. 6, 7, and 10; Hist (S/DECL 31 Dec 05), AFSCF, FY 1975, pp. 108-121; Ltr (U), AF/XOO to AF/RDP, subj: "Program 698 AJ," 8 Jan 1973 (Doc I-10); Memo (FOUO), Col Francis M. Shine, AFSCF/RY, to Col John Schmitt Jr., AFSCF/CC, subj: "Review of Resource Allocations to the AFSCF's 6594th Test Group," 6 Apr 1973 (Doc I-11).

17. Hist (S/DECL 31 Dec 07), AFSCF, Jul 1975 - Dec 1976, pp. 130-131; Intvw (S), MSgt Frederick Vater, Historian, with Col Thomas M. Sumner, USAF (Ret), 31 Jul 1985.] The AFSCF History describes the SRS as follows: "The SRS consisted of a boom assembly and a cradle assembly mounted on a carriage that could be moved on rails within the cargo compartment to the modified ramp for recovery operations. A winch with more than 100 feet of steel cable was mounted in the boom assembly; it could be operated hydraulically or electrically and could move the cable at varying speeds of 10 to 50 feet per minute in its primary, hydraulic mode. The cradle assembly, which was attached to both the carriage and boom assemblies, was used to convert the capsule attitude from a hanging (vertical) position to a retrieved (horizontal) position for transport. This system was controlled from a recovery control panel located on the cockpit control console."

19. Intvw (S), T.C. Hanley, Historian, with MSgt Richard A. Blankenship, 6594TG/SRE, 31 Jul 1985; Intvw (S), MSgt Frederick Vater, Historian, with Col Thomas M. Sumner, USAF (Ret), 31 Jul 1985.

20. Chronology (U), 6594 Test Group, 1958-1983 (Doc I-9); Hist (U), 6593 Test Sqdn, Aug - Dec 58, p. 1; ARDC GO No. G-38, 22 Jul 1958 (Doc I-12). When the C-119 crews started training at Edwards, they lost almost as many practice packages as they recovered, but as time went by and proficiency increased, their recovery percentage improved. By the time the squadron made its first attempt to recover a space capsule two years later, it was achieving a 95 percent success rate in practice runs. (Untitled, undated account of the recovery of the Discoverer XIV capsule (U), by Capt Harold E. Mitchell as told to Robert Cahn (Doc I-4).)

21. ARDC GO No. G-38, 22 Jul 1958 (Doc I-12); Ltr (U), Brig Gen O.J. Ritland, AFBMD/CC, to All Personnel, AFBMD, and Commander, 6594th Test Wing, subj: "Organizational Announcements," 22 Jun 1959 (Doc I-13).

22. Intvw (S), T.C. Hanley, Historian, with Col Teuvo A. Ahola, USAF (Ret), 8 Aug 1985; Hist (U), 6593 Test Sqdn, Jan-Jun 59, p. 2 and supporting document #1; ARDC GO No. 224, 27 Oct 1959; Hist (U), 6593 Test Sqdn, Jul-Dec 1959. Prior to the activation of the Instrumentation Squadron, the Kaena

Point Tacking Station had been manned by contractor personnel. Kaena Point was one of several stations activated to track and communicate with the polar-orbiting Discoverer satellites (and later with other orbiting military satellites as well).' All these tracking stations were controlled, directly or indirectly, by the 6594th Test Wing, forerunner of the Air Force Satellite Control Facility.

23. Intvw (S), MSgt Frederick Vater, Historian, with Col William M. Quinn, USAF (Ret), 31 Jul 1985.

24. Chronology (U), AFSCF, 1954-1983, p. vi; AFSC SO G-52, 21 Jun 1965; AFSC SO G-13, 1 Mar 66. The AFSCF was created by combining the 6594th Test Wing and the Deputy for Space Test Operations of Space Systems Division (SSD). SSD had inherited the space-related functions of the former AFBMD.

25. AFSC SO G-78, 20 Jun 1972; AFSC SO G-82, 23 Jun 1972; Hist (U), 6594 Test Group, Jul-Dec 1971 and Jul-Dec 1972; Intvw (S), MSgt Frederick Vater, Historian, with Col William M. Quinn, USAF (Ret), 31 Jul 1985.]

26. Ltr (S/OADR), Gen George S. Brown, AFSC/CC, to General Ryan, USAF/CC, subj: "Resource Allocations to the Air Force Satellite Control Facility (AFSCF) (U)," 30 Jan 1973 (Doc I-14); Recon Program Individual Savings Action (U), SAMSO to AFSC/ACX, Title of Action: "Consolidation AFSCF 6594th TG/OL-1," Jun 1973 (Doc I-15); Hist (U), 6594 Test Group, Jan-Jun 1973.

27. Organization and Functions Chart Book (U), Air Force Satellite Control Facility, 1 June 1979.

28. Ltr (S/OADR), AFSC/DO, Brig Gen Abbott C. Greenleaf, to USAF/PRP, Brig Gen Denniston, subj: "6594th Test Group (U)," 13 Apr 1973 (Doc I-16); Hist (S/DECL 31 Dec 05), AFSCF, FY 1975, pp. 105-106; Study (C/OADR), HQ USAF/DCS Plans & Ops, "An Analysis of Air Force Aerospace Rescue and Recovery Activities: Yellow Duck," 20 Sep 1966, 2 Vols. It should be noted that prior to the establishment of the AFSCF on 1 July 1965, a different pattern prevailed. Tracking and commanding of orbiting satellites was done by the AFSCF's predecessor, the 6594th Aerospace Test Wing, but development of the concepts and hardware needed for recovery was done, not by the Test Wing, but by its parent organization, Space Systems Division. It was only with the establishment of the AFSCF that both those functions were consolidated in one organization. (Chronology (U), AFSCF, 1954-1983; Organization and Functions Chart Book (U), Space System Division, 1 Sep 1964.)

29. ARDC GO No. G-38, 22 Jul 1958 (Doc I-12); USAF Host-Tenant Support Agreement (U), between the 15th ABW and the 6594th Test Group, 21 Jun 1984 (Doc I-17).

30. Hist (U), 6593 Test Sqdn, Jan-Jun 1959, p. 27, Jul-Dec 1962, p. 6, Jan-Jun 1967, p. 4, Jan-Jun 1968, p. 2, and Jul-Dec 1968, p. 10; Hist (U), 6594 Test Group, Jul-Dec 1966, p. 8, Jan-Jun 1967, pp. 2 and 6, Jul-Dec 1967, p. 8, and Jan-Jun 1968, pp. 2 and 8. In 1971, the AFSC Manpower Office reevaluated and rejustified maintenance manpower requirements and scrutinized and adjusted the distribution of maintenance manpower spaces

between the Test Squadron and the 6466th ABW. The adjustment left the Air Base Wing with 144 manpower spaces to support Test Squadron aircraft, and the Test Squadron with 161 for the same purpose. (Apparently all these spaces, even those allocated to the Air Base Wing, were funded by AFSC.) (Hist (U), 6594 Test Group, Jan-Jun 1971, p. 5.)

31. Background Paper on MAC Efforts to Assume the 6594th Test Group Mission, attached to Staff Summary Sheet (U), AFSC/TEOA, subj: "MAC/CC Proposal to Reassign the 6594th to ARRS," 10 Sep 1976 (Doc I-18); History (U) of MAC efforts to take over the Test Group mission, attached to Ltr (S/OADR), Col Charles L. Wilson, SAMSO/Asst Deputy for Satellite Control Operations, to AFSC/DO, subj: "Aerospace Rescue and Recovery Service Projected Requirements Study, Date April 1971," 14 Jun 1971 (Doc I-19); Ltr (U), 6594TG/SR to 6594TG/CC, subj: "Background Paper," no date (but written in 1975 or 1976) (Doc I-20); "White Paper in Rebuttal to the Proposed Transfer of the HC-130B Recovery Aircraft of the Air Force Systems Command to the Air Rescue Service" (U), no author, Mar 1964 (Doc I-21).

32. Study (C/OADR), HQ USAF/DCS, Plans & Ops, Directorate of Studies and Analysis, "Yellow Duck: An Analysis of Air Force Aerospace Rescue and Recovery Activities," 20 Sep 1966, Vol I.

33. Background Paper on MAC Efforts to Assume the 6594th Test Group Mission, attached to Staff Summary Sheet (U), AFSC/TEOA, subj: "MAC/CC Proposal to Reassign the 6594th to ARRS," 10 Sep 1976 (Doc I-18); History (U) of MAC efforts to take over the Test Group mission, attached to Ltr (S/OADR), Col Charles L. Wilson, SAMSO/Asst Deputy for Satellite Control Operations, to AFSC/DO, subj: "Aerospace Rescue and Recovery Service Projected Requirements Study, Date April 1971," 14 Jun 1971 (Doc I-19); Paper (U), "AFSC Recovery Forces located at Hickam AFB, Hawaii," no author/no date (but apparently written in late 1971) (Doc I-22); Study (C/OADR), ARRS/DCS Plans, "MAC/ARRS Evaluation of Aerospace Hardware Recovery Requirements," 25 May 1970 (Doc I-23); Draft Ltr (S/OADR), Gen Jack J. Catton, MAC/CC, and Gen James Ferguson, AFSC/CC, to Vice Chief of Staff of the Air Force, subj: "AFSC/MAC Space Hardware Recovery Study (U), attached to Ltr (S/OADR), Maj Gen Louis L. Wilson, Jr., SAMSO/CV, to Maj Gen John B. Hudson, AFSC/DCS Ops, 29 Jun 1970 (Doc I-24). The quotation in the text is taken from the draft letter prepared by SAMSO and sent to HQ AFSC. SAMSO hoped that it would be signed by the commanders of AFSC and MAC and forwarded to the Vice Chief of Staff of the Air Force to express an "agreement to disagree" on the part of MAC and AFSC and lay out their differing views on the Test Group question. The author of this chapter has seen no evidence to show whether this letter was ever signed by the two commanders or sent to the Vice Chief.

34. Ltr (C/OADR), Gen John C. Meyer, USAF/CCS, to MAC/CC, subj: "Review of Aerospace Rescue and Recovery Service and 6594th Test Group Mission (U)," 30 Jul 1970 (Doc I-25).

35. History (U) of MAC efforts to take over the Test Group mission, attached to Ltr (S/OADR), Col Charles L. Wilson, SAMSO/Asst Deputy for Satellite Control Operations, to AFSC/DO, subj: "Aerospace Rescue and Recovery Service Projected Requirements Study, Date April 1971," 14 Jun 1971 (Doc I-19); Paper (U), "AFSC Recovery Forces located at Hickam AFB, Hawaii," no author/no date but apparently written in late 1971 (Doc I-22); Study

(C/OADR), MAC/DCS Plans, "Aerospace Rescue and Recovery Service Projected Requirements Study," Apr 1971; Msg (S/OADR), AFSC to MAC/XP, subj: "ARRS Projected Requirements Study (U)," 211430Z Apr 1971 (Doc I-26); Ltr ((S/OADR), Gen John C. Meyer, USAF Vice Chief of Staff, to SAF/US, subj: "Transfer of 6593rd Test Squadron Mission to MAC/ARRS (U)," 12 Jul 1971 (Doc I-27); Ltr (S/OADR), Gen Meyer to Gen Brown, AFSC/CC, subj: "AFSC/MAC Space Hardware Recovery (U)," 22 Jul 1971 (Doc I-28). It should be noted that AFSC responded to the MAC initiative with a counterattack. It sent a letter to HQ USAF noting that the the MAC initiative apparently arose from a broad interpretation of the ARRS mission regulation, and suggesting that the regulation be clarified and/or amended to put this whole issue to rest and to preclude these periodic reassessments of the Test Group and its mission. This was a suggestion that AFSC had already made at least twice in the past, both times without success. The suggestion was not adopted this time, either. (Ltr (U), AFSC/DO to USAF/PRPL, subj: "ARRS Projected Requirements Study ," 1 Jul 1971, with 2 atchs (Doc I-29); AFR 23-19, "Organization and Mission - Field: Aerospace Rescue and Recover Service (ARRS)," 10 Jul 1974 (Doc I-30).

36. Ltr (U), Gen Jack J. Catton, MAC/CC, to Gen George S. Brown, AFSC/CC, 27 Jan 1972, with one atch (Doc I-31); Ltr (U), Gen Brown to Gen Catton, 9 Feb 1972 (Doc I-32).

37. Ltr (U), Gen Paul K. Carlton, MAC/CC, to Lt Gen George J. Eade, USAF/XO, 29 Mar 1973 (Doc I-33); Memo (FOUO), Col Francis M. Shine, AFSCF/RY, to Col Schmitt, AFSCF/CC, subj: "Review of Resource Allocations to the AFSCF's 6594th Test Group," 6 Apr 1973 (Doc I-11); Trip Report (U), Col Shine, 5 Apr 1973 (Doc I-34).

38. Ltr (S/OADR), Gen Samuel C. Phillips, AFSC/CC, to Gen Paul K. Carlton, MAC/CC, 21 Nov 1974 (Doc I-35).

39. Ltr (U), Gen Paul K. Carlton, MAC/CC, to Gen William J. Evans, AFSC/CC, 31 Aug 1976 (Doc I-36); Ltr (U), Gen Evans to Gen Carlton, 20 Sep 1976 (Doc I-37).

40. Study (S/OADR), MAC/DCS Plans, "Aerospace Rescue and Recovery Service Projected Requirements Study," Apr 1971; Ltr (S/OADR), Col John J. Schmitt, Jr., AFSCF/CC, to AFSC/DO (Brig Gen Slay), subj: "AFSC/MAC Space Hardware Study (U)," 8 Jul 1971 (Doc I-38); Draft Ltr (S/OADR), Commanders, AFSC and MAC, to Vice Chief of Staff of the Air Force, subj: "AFSC/MAC Space Hardware REcovery Study (U)," no date and no signatures, attached to Ltr (S/OADR), Maj Gen Louis L. Wilson, Jr., SAMSO/CV to Maj Gen John B. Hudson, AFSC/DCS Ops, 29 Jun 1970 (Doc I-24); Ltr (U), Gen Jack J. Catton, MAC/CC, to Gen George S. Brown, AFSC/CC, 27 Jan 1972 (Doc I-31); Ltr (U), Gen Brown to Gen Catton, 9 Feb 1972 (Doc I-32); Ltr (U), Gen Paul K. Carlton, MAC/CC, to Lt Gen George J. Eade, USAF/XO, 29 Mar 1973 (Doc I-33); Background Paper (U), 6594TG/SR to 6594TG/CC, subj: "Background Paper," no date, but written no earlier than Dec 1974 (Doc I-20).

41. Hist (S/RD), AFSCF, FY 1982, p. 176; Hist (S/RD), AFSCF, FY 1983, pp. 162, 164; Staff Study (S/DECL 1 Dec 98), 6594 Test Group, "JC-130 Aircraft Reduction," 6 Apr 1982 (Doc I-39).

42. Msg (S/DECL 1 Dec 98), AFSCF/RY to 6594TG/SR, subj: "Advance

Studies (U)," 232155Z Apr 1981 (Doc I-40); Msg (S/DECL 1 Dec 98), AFSCF/RY to 6594TG/SR, subj: "Advanced Planning (U)," 272145Z Jul 1981 (Doc I-41); Staff Study (S/DECL 1 Dec 98), 6594TG, "Reduced Aerial Recovery Force and Surface Recovery Only (U)," 8 Sep 1981 (Doc I-42); Staff Study (S/DECL 1 Dec 98), 6594TG, "C-130 Drawdown Checklist and Procedures," 28 Jun 1983 (Doc I-43); Msg (S/DECL 1 Dec 98), AFSCF/RY to AFSC/LGMW/TE, subj: "6594TestG Operations (U)," 081630Z Mar 1984 (Doc I-44); Msg (S/DECL 1 Dec 98), AFSCF/RY to 6594TG/SR, subj: "Changes to Operational Requirements (U)," 161820Z May 1984 (Doc I-45); Msg (S/DECL 1 Dec 98), AFSCF/RY to AFSC/LGMW/TE, subj: "Transfer of 6594 TestG JC-130B Aircraft S/N 57-0529 and 58-0716 (S)," 051835Z Jun 1984 (Doc I-46); Msg (S/OADR), 6594TG/CC to AFSC/MPR, subj: "Aircrew Manpower and Personnel Planning (U)," 052306Z Jul 1984 (Doc I-47); Msg (S/OADR), 6594TG/CC to AFSCF/CC, subj: "Implementation of 6594 Test Group OPLAN 1-84 (U)," 150232Z Sep 1984 (Doc I-48); Study (S/DECL 1 Dec 98), 6594 TG, "6594th Test Group Resource Utilization," 2 Nov 1984 (Doc I-49).

43. Msg (S/DECL 28 Aug 85), USAF/PAX to AFSC/TE and MAC/XP, classified subject, 191530Z Sep 1979, quoted in Hist (S/RD), AFSCF, FY 1983, p. 164; Msg (S/DECL 1 Jan 89), USAF/RDS to AFSC/TE/AC/MP, subj: "6594th Test Group Operations (U)," 091330Z Mar 1983 (Doc I-50); Memo for Record (C), Col Charles R. Dunn, 6594TG/CC, subj: "[redacted] Test Group Future," 22 Dec 1983 (Doc I-51); Ltr (S/DECL 1 Jan 1989), Col Eric B. Nelson, AFSC/CS, to AFSC/TE, subj: "Deactivation of the 6594TG (S)," 31 Jan 1984 (Doc I-52); AFSC PAD 84-1 (S/DECL 1 Jan 89), AFSC/TE, "Deactivation of the 6594 TestG (C)," 30 Mar 1984 (Doc I-53); AFSC IP 84-1 (S/OADR), AFSC/TE, "Deactivation of the 6594th TestG (AFSC) (S)," 1 Mar 1985 (Doc I-54); Msg (U), 6594TG/RM to AFSC/TEU/MPRO/MPRA et al., subj: "Establishment of Office of Resource Management," 090058Z Apr 1985 (Doc I-55).

44. AFSC PAD 84-1 (S/DECL 1 Jan 89), AFSC/TE, "Deactivation of the 6594 TestG (C)," 30 Mar 1984 (Doc I-53); Brfg (U), on the deactivation of the Test Group, probably put together by someone in AFSC early in 1984 (Doc I-56).

45. Msg (S/OADR), 6594TG/RM to AFSC/TEUP, subj: "Aircraft Disposition," 010215Z Aug 1985 (Doc I-57); Msg (S/OADR), AFSC/TEO to 6594TG/RM, subj: "Aircraft Disposition (U)," 202100Z Sep 1985 (Doc I-58); Msg (S/OADR), AFSC/TEU to MAC/DOO/LGM/XPP et al, subj: "On-Site Aircraft Survey (U)," 081310Z Oct 1985 (Doc I-59); Msg (U), OSAF/PAM to 6594TG/CC and 15ABW/PA, subj: "PAG for Deactivation of 6594th Test Group," 031900Z Jun 1986 (Doc I-60); AFSC IP 84-1 (S/OADR), AFSC/TE, "Deactivation of the 6594th TestG (AFSC) (S)," 1 Mar 1985 (Doc I-54).

46. Paper (S/DECL 1 Dec 98), no author, no title, and no date, but probably written by someone in the Test Group in 1983 (Doc I-61); AFSC PAD 84-1 (S/DECL 1 Jan 89), AFSC/TE, "Deactivation of the 6594 TestG (C)," 30 Mar 1984 (Doc I-53); AFSC IP 84-1 (S/OADR), AFSC/TE, "Deactivation of the 6594th TestG (AFSC) (S)," 1 Mar 1985 (Doc I-54).

47. See note above.

48. Msg (S/OADR), 6594TG/CC to AFSC/MP/SP, subj: "Proposal for Personnel Conference," 060237 Oct 1984 (Doc I-62); Ltr (C/DECL 1 Dec 98), 6594TG/SR to 6594TG/CC, subj: "Trip Report: HQ AFMPC Personnel Conference

(12-15 Nov 84) (U)," 18 Dec 84, with atchs (Doc I-63); Routing and Transmittal Slip (U), LtCol Fouts to AFSCF/RY (Maj Stoneberger), 22 May 1985, with atch: Ltr (U), 6594TG/RM to 6594TG/CD/CC, subj: "RM Trip Report, 4-11 May 1985," 21 May 1985 (Doc I-64); Msg (U), 6594TG/RM to AFSC/MPRA, subj: "DEROS Extension to 30 June 1987 (AFMPC Personnel Conference, 14-15 Nov 84)," 100210Z Jul 1985 (Doc I-65); Msg (U), AFMPC/MPCRAS1 to 15ABW/DPMUM, subj: "DEROS Extensions to 30 Jun 87," 281345Z Aug 1985 (Doc I-66); Msg (U), 6594TG/CC to AFMPC/DPMRA/DPMRR/DPMRS and AFSC/MPR, subj: "Personnel Assistance Team Visit," 080130Z Nov 1985 (Doc I-67); Msg (S/OADR), 6594TG/CC to AFSC/TE/MP/MPR/MPRA/CMS, subj: "Personnel Assistance Team Visit," 180215Z Jan 1986 (Doc I-68); Msg (S/OADR), AFMPC/DPMR to AFSC/MP, subj: "Personnel Team Visit (U)," 051200Z Feb 1986 (Doc I-69); Msg (U), AFSC/MPRO to 6594TG/CC/RM, subj: "Personnel Team Visit," 191920Z Feb 1986 (Doc I-70); Msg (S/OADR), 6594TG/RM to AFSC/MPR/MPRA/MPRO/TE and AFMPC/DPMR/DPMRAS1/DPMRRA, subj: "Personnel Team Visit (U)," 050015Z Mar 1986 (Doc I-71).

49. Ltr (S/OADR), 15 ABW/DPC to PACAF/DPCS, subj: "Request for Clearance to Conduct a Reduction-in-Force (RIF) (U)," 31 Mar 1986, with atch (Doc I-72); Msg (S/OADR), PACAF/XP to USAF/PRI/PRM/PRP/XOX/DPC and AFSC/XR/SD/MP, subj: "6594th Test Group (U)," 071730Z Apr 1986 (Doc I-73); AFSC PAD 84-1 (S/DECL 1 Jan 89); AFSC/TE, "Deactivation of the 6594 TestG (C)," 30 Mar 1984 (Doc I-53); AFSC IP 84-1 (S/OADR), AFSC/TE, "Deactivation of the 6594th TestG (AFSC) (S)," 1 Mar 1985 (Doc I-54).

50. Msg (S/OADR), AFSCF/RY to AFSC/LGM, subj: "Transfer of Aircraft (U)," 232330Z Apr 1986 (Doc I-74); Msg (S/OADR), USAF/RDS to AFSC/TE/AC/MP, subj: "6594th Test Group Operations (U)," 152030Z May 1986 (Doc I-75); Msg (S/OADR), AFSC/TE to 6594TG/CC, subj: "6594 Test Group Operations (U)," 211430Z May 1986 (Doc I-76); Msg (U), AFSCF/CC to AFSC/TE/TEVA, subj: "6594th Test Group Operations," 050100Z Jun 1986 (Doc I-77).

51. Ltr (S/OADR), AFSC/TE to USAF/RDS, subj: "AFSC Implementation Plan 84-1, 6594th Test Group (U)," 5 Jun 1985 (Doc I-78); Memo for the Record (C/OADR), Capt Kurt H. Kimball, AFSCF/RY, subj: "Classification of IP 84-1 (U)," 18 Jul 1985 (Doc I-79); Msg (S/OADR), AFSCF/RY to 6594TG/RM/CC, subj: "Classification of IP 84-1 (U)," 191600Z Jul 1985 (Doc I-80); Msg (S/OADR), 6594TG/RM to AFSCF/RY, subj: "Classification of IP 84-1," 062130Z Aug 1985 (Doc I-81).

52. Msg (S/OADR), PACAF/XP to USAF/PRI/PRM/PRP/XOX/DPC and AFSC/XR/SD/MP, subj: "6594th Test Group (U)," 071730Z Apr 1986 (Doc I-73); Msg (S/OADR), 6594TG/CC to AFSC/TE/AC/MP/SD, subj: "6594th Test Group Operations (U)," 170009Z May 1986 (Doc I-82); Msg (U), USAF/RDS to AFSC/TE/AC/MP, subj: "6594th Test Group Operations," 031900Z Jun 1986 (Doc I-83); Msg (U), OSAF/PAM to 6594TG/CC and 15ABW/PA, subj: "PAG for Deactivation of 6594th Test Group," 031900Z Jun 1986 (Doc I-60).

53. Ltr (U), AFSCF OL-AC/CC to SD/CFP et al., subj: "Lessons Learned - Deactivation of the 6594th Test Group," 21 Oct 1986, with atch (Doc I-84); Hist (S/OADR), PACAF, Jan-Dec 1986, p. 199; Intvw (U), T.C. Hanley, Historian, with John Sizemore, AFSC/TEOA, 9 Aug 1988. After the Group was deactivated, the AFSCF established an operating location at Hickam manned by former Test Group personnel awaiting reassignment, retirement, etc. Its job was to tie up loose ends and close out the final paperwork for the Group,

and one of the tasks it performed was the preparation of the report on lessons learned just cited. (Memo (U), MSgt Frederick H. Vater, CSTC/HO, to Dr. T.C. Hanley, SD/HO, subj: "Test Group Data," 23 Jul 1988.)

54. Hist (U), 6593 Test Sqdn, Jan-Jun 1961, p. 3; Memo (U), MSgt Frederick H. Vater, CSTC/HO, to Dr. T.C. Hanley, SD/HO, subj: "Test Group Data," 23 Jul 1988.

55. Intvw (S), MSgt Frederick Vater, Historian, with Col William M. Quinn, USAF (Ret), 31 Jul 1985. Quinn added that morale was not as good among the helicopter people as it was among the C-130 people because they rarely got to perform their mission and recover a capsule. In addition, he said, when the helicopters operated off the ships, the crews had to spend a lot of time at sea.

56. See note above.

CHAPTER II

RESOURCES

The 6493rd Test Squadron (Special) (ARDC) was the the first of the 6594th Test Group's units to be organized therefore the story of the Group's resources must begin with the establishment of the 6493rd. Since, as has been noted in Chapter I, the Squadron had a high priority it was able to form quickly and with the aid of almost all of the Major Air Commands. Initially the Squadron was formed at Edwards AFB, California for establishment and initial training and then move to Hickam AFB, Territory of Hawaii (TH), as soon as possible after 1 January 1959. However, the establishment of the operational component and its training progressed so well that the Air Research and Development Command (ARDC) found that the 6593rd and the initial elements of the Group were able to move to their duty station (Hickam) more than a month earlier than planned. A fact which clearly reflects on the capabilities and dedication of the newly assigned personnel of the new unit.

The rapid formation and initiation of training created many problems for the embryo unit. The early histories of the command detail these difficult problems; many which seemed inextricable to the personnel encountering them. Never the less the problems were resolved and the command maintained its rigid training schedule. Headquarters ARDC , anxious to begin the mission in earnest, encouraged the 6593rd to maintain its rapid training pace of training and indicated pleasure with the progress of the new unit. The Headquarters working with the Edwards people, other Major Air Commands and the new unit helped resolve many of the problems while the new personnel of the 6593rd resolved all of the obstacles that were creating the problems that seemingly would not be resolved in the near future.

By all accounts especially through interviews with former personnel and by the discussions in early histories of the Squadron, the accolades for the successes in establishment of the organization and training was due to

the high caliper of personnel assigned to the Squadron.[2] For instance before the unit left Edwards it had a sixty-four percent success ratio for its primary mission of air-to-air retrieval of parachuted packages. This remains an almost amazing statistic because few of the air crew members had ever made air-to-air retrievals. In addition by the time the unit was reassigned to Hawaii it had most of the administrative problems associated with the unit's activation solved.

Problems

As noted above, because of its high priority when the 6593rd was first formed at Edwards AFB it was assigned and acquired personnel of the highest level from all over the Air Force. Never the less even with the highest priorities the establishment of the unit was not smooth. Many of the problems that were encountered, at the time, seemed insoluble to most of the personnel assigned. These difficulties ranged from mal-assignments of people, the assignment of incorrect AFSC's to orders, for many, that reflected the wrong final destination for the assignees or their personal property and household goods. To further cloud the issues the mal-assignments required the Squadron to commence aerial recovery training with personnel that lacked the correct expertise and experience. This latter factor required the Squadron to initiate an immediate on-the job training program.[3]

Early in September the Squadron's administrative section was in-place and the Edwards AFB people turned over all administration and personnel problems to the Squadron. With the assumption of the full range of administrative duties the Squadron/Group were then in charge of their own destinies and proved that, indeed, the people selected for the establishment of a new unit was correct. By the time of the move to Hickam AFB and the resolution of many of the more difficult problems command people began to reflect on their experience and established a "lessons Learned" discussion in their first history. This list has been reduced to a tabular form for the reader/researcher and is listed below:

1. Personnel who must contribute the most to activating a unit be the first assignees.

2. Among the above would be officers and airmen that are specialists in the personnel, administrative, supply and maintenance career

fields.

3. Commands that are directed to supply personnel should be advised how to provide a uniform and correct set of orders to personnel.

4. Financial and transportation matters should be consistent on all orders.

5. Agreements be finalized by commands as to the type of assistant will be made available prior to a new unit's arrival at a temporary or permanent station.[4]

As noted above, originally the unit was to transfer to Hickam AFB as soon after 1 January 1959 as was possible.[5] However, the unit progressed so well in its training and the development of unit integrity that Headquarters ARDC found it ready to begin training and operations by the January 1959. Therefore ARDC issued another set of movement orders[6] which called for a 1 December 1958 movement.

Therefore, on 1 December the movement of the 6493 Test Squadron and the embryo 6594th Test Group from Edwards AFB to Hickam AFB began. All of the transportation of personnel and dependents was provided by the Military Air Transport Service (MATS)[7]. Using Edwards as a port of embarkation the flights were dispatched directly to Hickam AFB. The movement of the personnel and their dependents progressed without mishap and the airlift operation functioned so smoothly that by 4 December the bulk of personnel were in-place at Hickam ready to begin operations. Unit aircraft and some other equipment was flown to the unit's home station by the aircrews assigned to the individual aircraft.

Much of the credit for the successful troop movement must go to the Squadron establishment Implementation Plan, which called for the prepositioning of squadron personnel at Hickam AFB. These prepositioned people made sure that the plan was error-free, hence all of the MATS flights were met by 6593rd administrative and personnel people at Hickam, who had arranged quarters and other necessities for the in bound people. Families were settled immediately in hotels while other personnel were placed either in base facilities or hotels. In all, the movement was was successful and the unit was able to become[8] to begin operations in January.

Squadron Manning

As is noted in Table I[9] the initial manning of the squadron was 183 authorized people consisting of 33 Officers and 150 Airmen. However from the initial manpower posture of August 1958 to October 1958 the strength figures dropped to 32 officers and 85 airmen for a total of 117 authorizations. The assigned strength stayed at 183 people until January 1959 when the assignments began to approximate the authorizations.[10]

The reason for the drop in personnel was due to the fact that initially the squadron was over-manned in order to accomplish the myriad duties of unit activation. Primarily these personnel were assigned to the maintenance, supply and administration functions. However, when orders were received for the movement to its permanent base at Hickam AFB, Hawaii the assigned surplus personnel that were accomplishing duties normally provided by a base were reassigned to the base.[11] Of course not all of the reassignments were immediately accomplished which left the unit always slightly over-strength until 1 July 1960 when the unit became slightly under strength, as is noted in Table I. When the squadron reached its authorized strength and the full range of its operations were being accomplished the personnel assignments remained static. Primarily this was true because of the Squadron's high mission priorities because of the importance of the unit's mission and hence training.

The first two Unit manning documents; one dated August 1958 and the other dated October 1958, are attached as Appendixes I and II of this volume. It is clear when reviewing these documents that the majority of reductions shown in the October documents reflect the deletion of the base- type maintenance functions that were not available at Edwards AFB. While Edwards actually had the correct type of maintenance personnel assigned it was engaged in the difficult fast-paced test mission. Hence, could not always provide the type of personnel needed for the Squadron's operations and needs. The fact that the base- type personnel were initially assigned to the Squadron and then later to Hickam AFB (some to Edwards) shows a careful planning for the establishment of the correct manning throughout the unit establishment planning process. It is apparent that the planning for the establishment of the Squadron had been completely and carefully accomplished thought-out. As can be noticed in Table II the organization of the August Squadron and the October Squadron changed dramatically. Dropping from the August chart were the following functions:

PERSONNEL AUTHORIZED/ASSIGNED
6493rd TEST SQUADRON
TABLE I

Date	Authorized				Assigned			
	Off	Amn	Civ	Tot	Off	Amn	Civ	Tot
1 Aug 58	33	150		183	33	150		183
1 Oct 58	32	85		117	33	150		183
1 Jan 59	32	85		117	33	87		120
1 Jul 60	35	97		132	35	88		123
1 Jan 61	36	97		133				
31 Dec 61	42	121		163	50	146		196
30 Jun 62	42	121		163	47	152		199
31 Dec 62	42	137		179	40	133		173
30 Jun 63	41	138		179	40	143		183
31 Dec 63	41	141		182	41	139		180
30 Jul 64	42	163		205	35	115		150
31 Dec 64	42	167		209	42	129		171
30 Jun 65	71	259	1	330	47	273	0	320
31 Dec 65	71	259	1	331	66	291	1	358
30 Jun 66	73	233	1	307	70	261	1	332
31 Dec 66	73	298	1	372	72	258	1	331
30 Jun 67	73	297	1	371	60	238	1	299
31 Dec 67	73	297	1	371	60	257	1	318
30 Jun 68	73	334	22	429	66	297	17	380
31 Dec 68	73	354	22	449	66	295	16	377
30 Jun 69	73	356	22	451	67	358	15	440
31 Dec 69	74	372	17	463	72	320	12	404
30 Jun 70	74	321	17	412	71	323	15	409
31 Dec 70	74	313	17	404	66	278	16	360

30 Jun 71	74	313	17	404	68	282	16	366
31 Dec 71	68	313	21	402	68	303	17	388
30 Jun 72	63	309	15	387	72	308	16	396

1. Aircraft Engine Maintenance.

2. Airframe Maintenance.

3. Aircraft Electric Systems Maintenance.

4. Aircraft Hydraulic Maintenance.

5. Aircraft Instrument Maintenance.

6. Aircraft propeller Maintenance.

7. Aircraft Auxiliary Equipment Maintenance.

8. Communications Electronic Maintenance.[12]

With the final adjustment made in October the Squadron was capable of entering the stage of Initial Operational Capability (IOC). When this stage was reached the Squadron was divided into two Flights. The available aircraft for the Flights had air and ground crews assigned per aircraft. With these assignments the crews were capable of conducting both training or mission operations. A factor which greatly aided operations when the unit began making "catches" in earnest. For Flight and aircraft ground and air crew assignments see Appendix II.[13]

(U) As noticed in Table I the Squadron's manning continued to grow until it reached an apex of 463 authorizations on 31 December 1969. Assignments never matched the authorizations during this period with the highest total (440 people) being reached on 30 June 1967. The unit was at least 83 percent manned at its even at its low point on 31 December 1968, at the height of the Vietnam War and just after the Tet Offensive. After 30 June 1972 the Squadron personnel statistics were no longer counted because the squadron was absorbed into the 6594th Test Group on 1 July 1972. Although the Squadron had been assigned to the Group throughout its existence it now became integral part of the Group on the above date.

6594th Test Group.

(U) The Test Group (in 1959 the 6594 Recovery Control Group) was activated on 27 October 1959 by ARDC General Order 224.[14] To be located at Hickam AFB, Hawaii it was to have control the 6593rd Instrumentation Squadron that was located at Kaena Point Satellite Tracking Station and the 6593rd Test Squadron (Special). The 1 July 1972 orders

TABLE II

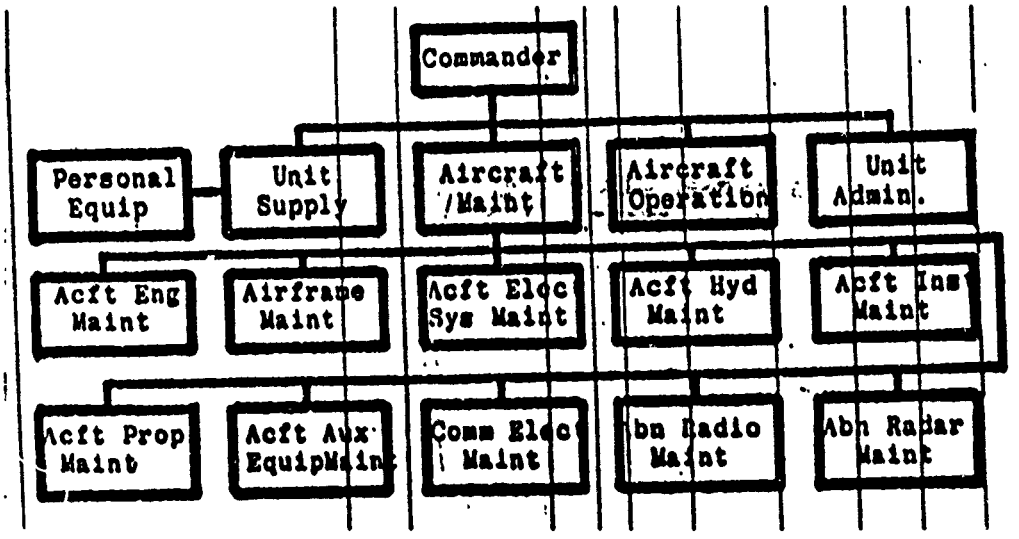
ORGANIZATIONAL TABLES

6593rd TEST SQUADRON (SPECIAL)

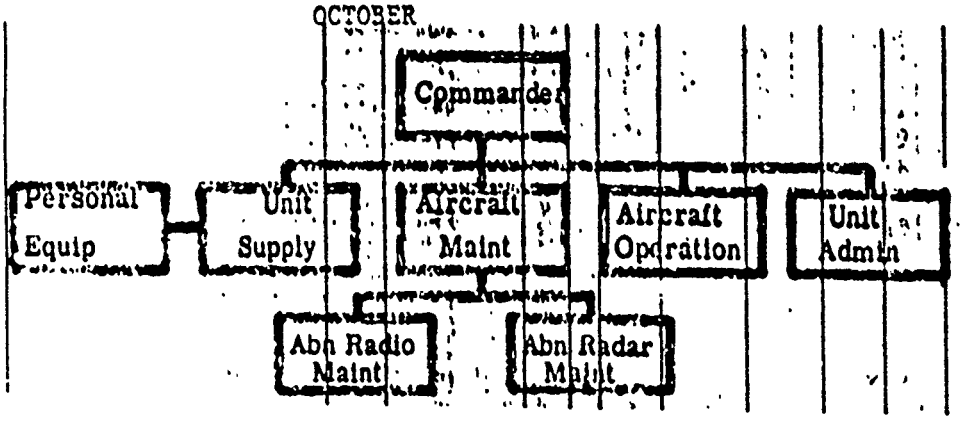
AUGUST AND OCTOBER

1958

AUGUST



OCTOBER



Note: Table developed from Unit Manning Documents of the 6593d Test Squadron (Special)--Aug and Oct 1958; see Appendixes I and II

reassigned the Instrumentation Squadron to the Air Force Satellite Control Facility (Special Order G 78, 20 June 1972), as was the Test Group (with the absorbed Squadron).[15]

At first the commander of the Squadron was dual hatted but as the new command moved into its first operational year the Group Commander lost the Squadron position as the Group became an important recognizable entity. As noted in Table III the Group, at first, consisted only of 25 people but as with the Squadron continued to grow until the Group was authorized about 60 people. This occurred in 1965 and held at about that number of authorizations until 1970 when the authorizations dropped into the 50's. Of course on the 30th of June 1972 the Group headquarters dropped to 45 people in preparation for the absorbtion of the Squadron into the Group.[16]

The assigned statistics show that for the first year or so that the personnel assigned fell below the authorizations but by 31 December 1961 the assigned personnel for the Group were only slightly below the authorizations. This fact held through the Vietnam War and continued until 1972 when the Squadron was absorbed. In fact, during the entire Vietnam period the Group was rarely manned by less than 90 percent of the authorizations. However from 1972 until the demise of the orgAnization there appears to be almost wild fluctuations in the Groups Manning. Table III shows that on 31 December 1973 the Group had 73 less people than was authorized for a percentage of minus thirteen. However the authorizations began a dramatic rise over the 1972 figures. On 31 December 1972 the Group had 431 people authorized and a year later 563. Never the less Group manning held at over 500 authorization and assignees until after 30 September 1984 when the group already lost its last hard mission and given up two of its aircraft.

Deactivation

Originally the Group was scheduled to disestablish on 30 September 1987 but as it had during its activation phase the Group had completed most of its deactivation activities and was able to deactivated on 30 September 1986. This early deactivation was directed by AFSC Special Order Ninety- Six of 18 June 1986. It allowed the parent command to meet a congressional directed budget reduction.

During the deactivation phase the Group generally

PERSONNEL AUTHORIZED/ASSIGNED
6594th TEST GROUP
TABLE III

Date	Authorized				Assigned				Gains/Losses
	Off	Amn	Civ	Tot	Off	Amn	Civ	Tot	Cum
1 Jul 60	10	13	2	25	7	3	2	12	-13
1 Jan 61	20	16	2	38	12	7	2	21	-17
30 Jun 61	20	16	4	40	16	15	4	35	-5
31 Dec 61	21	23	4	48	20	23	4	47	-1
1 Dec 62	19	23	4	46	17	25	4	46	0
30 Dec 63	17	24	4	45	19	19	4	42	-3
31 Dec 63	18	23	4	45	19	19	4	42	-3
1 Jan 64	17	23	4	44	18	20	4	42	-2
1 Jul 64	17	23	4	44	18	25	4	47	+3
31 Dec 64	18	27	4	49	18	23	4	45	-4
30 Jun 65	28	32	6	66	18	27	6	51	-15
31 Dec 65	28	33	7	68	27	38	7	72	+4
30 Jun 66	22	34	7	63	22	33	7	62	-1
31 Dec 66	21	33	7	61	24	32	7	63	+2
30 Jun 67	21	33	6	60	24	28	6	68	+8
31 Dec 67	23	35	*	64	21	33	*	60	-4

* - The Manning Section of the history report indicated there were no civilians authorized or assigned, but changes were indicated in other portions of the history reports.

Date	Authorized				Assigned				
	Off	Amn	Civ	Tot	Off	Amn	Civ	Tot	Cum
30 Jun 76	99	425	21	545	102	411	19	532	-13
31 Dec 76	99	425	21	545	98	421	21	540	-5
30 Jun 77	99	425	21	545	96	426	21	543	-2
31 Dec 77	100	425	21	546	97	422	21	540	-6
30 Jun 78	100	426	21	547	98	418	21	537	-10
31 Dec 78	100	426	21	547	101	446	20	567	+20
30 Sep 79	100	426	20	546	103	426	20	549	+3
31 Mar 80	100	426	20	546	100	410	20	530	-16
30 Sep 80	97	426	20	543	98	422	19	539	-4
31 Mar 81	97	427	20	544	101	444	20	565	+21
30 Sep 81	97	427	20	544	91	400	18	509	-35
31 Mar 82	97	425	20	542	99	432	20	551	+9
30 Sep 82	97	425	20	542	95	421	20	536	-6
31 Mar 83	97	465	20	582	100	455	20	575	-5
30 Sep 83	97	465	20	582	100	449	20	569	-13
31 Mar 84	97	465	19	581	107	460	18	585	+4
30 Sep 84	97	465	19	581	101	444	18	563	-18

Date	Authorized				Assigned				
	Off	Amn	Civ	Tot	Off	Amn	Civ	Tot	Cum
30 Jun 68	23	35	*	64	21	31	*	58	-6
31 Dec 68	23	33	*	62	18	33	*	57	-5
30 Jun 69	22	33	*	61	19	33	*	58	-3
31 Dec 69	22	33	*	61	21	33	*	60	-1
30 Jun 70	22	33	* #	60	18	30	*	54	-6
31 Dec 70	17	33	*	56	17	32	*	55	-1
30 Jun 71	17	33	*	56	17	32	*	55	-1
31 Dec 71	17	33	6	56	17	32	6	55	-1
30 Jun 72	14	25	6	45	17	28	6	51	+6
31 Dec 72	77	333	21	431	83	326	20	429	-2
30 Jun 73	77	333	20	430	77	353	20	450	+20
31 Dec 73	102	441	20	563	88	383	19	490	-73
30 Jun 74	116	470	21	607	102	420	19	541	-66
31 Dec 74	99	406	21	526	102	414	20	536	+10
30 Jun 75	99	413	21	533	107	425	19	544	+11
31 Dec 75	99	425	20	544	105	423	19	547	+3

* - Indicates there were no civilians authorized or assigned.

\# - Indicates one civilian position was lost.

GROUP BUDGET
TABLE IV

Fiscal Year	Expenditures
66	292,000
65	490,437
66	494,248
67	454,340
68	437,341
69	1,132,046
70	1,416,736
71	1,683,134
72	4,010,516
73	1,755,518
74	1,870,342 O&M; $1,255,000 AvFuel
75	2,314,539 O&M; $2,400,3590 AvFuel
76	2,660,900 O&M; $2,692,000 AvFuel
7T	881,992 O&M; $630,006 AvFuel
77	2,859,200 O&M; $3,392,000 AvFuel
84	4,942,200 O&M

maintained the end strength of FY 1984. This was maintained primarily because the unit was directed to maintain its primary and secondary mission until T-day.

> The 6594th TestG will maintain its aerial and surface recovery capability through the date of mission termination identified in AFSC 17 PAD 84-1. This date defined as T-Day in this plan.

Details of the command's last manning can be seen in its last UMD, (the 6 May 1985 UMD), which is Appendix III, this history. This document portrays the various aspects of the 6594th manning through the end of its active period. It will also show the numbers and the type of people and training needed to maintain and operate a command of the nature of the 6495 Test Group. Of particular interest should be the numbers and types of Air Force Specialty Codes (AFSC's) and the number of people assigned each code. An evaluation of this type of information would provide any researcher with an excellent idea of the composition of the Test Group.

Therefore throughout FY 1985 and FY 1986 the personnel strength and budget remained static. There, of course, was some degradation of personnel strength as T-Day drew near. However, at the deactivation General Lawrence Skantze addressed a full unit to thank the personnel of the 6594th for their efforts towards accomplishing their difficult and important mission.

BUDGET

As can be noticed in Table IV the budget for the Group varied greatly over the years with the highest level reached in the 1980's and primarily maintained throughout the ensuing fiscal years in accordance with PAD 84-1. Obviously part of the rising budget can be attributed to the inflationary cycle that bedeviled Air Force financial planners throughout the period. On the other hand budget was always influenced by the unprogrammed efforts which more often than not were rescue missions.

The spotty financial information available to researchers was due in a large part because the unit was never assigned a historian and records were not kept. It is virtually impossible to construct budget record over a

period of 28 years when the researcher is at the mercy of additional duty personnel with little or none historical training and often with little interest in preserving the record.

The last budget document available that provides indications of the costs of command operation is the Fiscal Year 1988 Program Objective Memorandum (POM) for the test group which was published on 15 July 1985. This document, which will be enclosed in the history as Appendix IV, delineates the amounts of funds needed to operate a unit such as the 6495th, as well as, the various budget categories and amounts of funds needed to function within each category. As noted above this fund level held true until the demise of the organization on 30 September 1986.

With the last sentence the resource perspective of the 6594th must be closed. It will become integral and important part of a command's close-out history. While other chapters are stronger because the recount the organizational changes and deeds of an American Space and intelligence venture. Much more interesting data than that which should have been recorded in the personnel and financial sections of the staff reports. But the missing data, over the years, when the deeds are forgotten the historian will be asked over and over again what was the manning ? or what were the budget features? And, alas, the historian will not be able to construct a solid budget picture because of the frailties of men who were bored with budget figures and thought so little of the historian who requested and needed the statistics that they provided only the overall data.

Fortunately this historian is able to construct manning figures but not at the depth that would be meaningful to a commander attempting activate a new command, whose exotic mission would be similar to the 6594th Test Group.

The object lesson is that all commanders should insure that they have a conscientious historian (professional or additional duty) and insure that the mundane statistics of operations are provided that historian.

CHAPTER 3

LOGISTICS

Assigned Aircraft

From the time of delivery of the first C-119 aircraft to Hickam AFB on 10 December 1958, to the transfer of the last C-130 aircraft to Hill AFB, UT, on 30 July 1986, the 6594 Test Group was assigned ten different mission design series (MDS) aircraft. They were:

- C-119J, manufacturer: Fairchild. Popular name: Flying Boxcar. The C-119J was a converted C-119F or C-119G model aircraft. It was modified with a rear fuselage incorporating an operable in flight clam shell door.

- C-119F, same as a C-119J model. Power was also provided by two R-3350-89 wright reciprocating engines.

- C-119G, same as a C-119F model, except with Aeroproduct propellers in lieu of Hamilton Standard.[1]

- C-130B, manufacturer: Lockheed. Popular name: Hercules. Power was provided by four T56-A-7/7A engines. The C-130B model was an improved C-130A model.

- HC-130H, same as a C-130B model except power was provied by four T56-A-15 engines. Additionally, the aircraft has special equipment for search and rescue missions and aerial recovery.

- HC-130P, same as a C-130H model except modified to aerial refuel helicopters.

- HH-53C, manufacturer: Sikorsky. Popular name: Super Jolly. Power was provided by two T64-GE-7 engines. The HH-53C is an upgraded HH-53B configured for combat Air Rescue Recovery Service (ARRS) and has air refueling capability.

- SH-3A, manufacturer: Sikorsky. Popular name: Sea King. Power was provided by two T58-GE-8B engines. The SH-

3A has one five blade main rotor and one five blade tail rotor, retractable main gear and an amphibious hull.

- CH-3B, same as SH-3A except it has a main antitorque rotor and has drone recovery and airlift capability.[2]

- CH-21B, Manufacturer: Vertol. Popular name: Workhorse. Power was provided by a single R-1820-103 wright reciprocating engine. The CH-21B had a 208 nautical mile range with a 3,145 pound payload at 77 knots.

C-119J

Sixty-two F and G model C-119s were converted to C-119Js. Ten of these were transfered to the 6594 Test Group. The C-119J model modification incorporated a flight operable door, following the development of this feature on C-119F-KM serial number 51-8119.

The 6594 Test Group's C-119Js were modified repeatably prior to delivery to Hickam AFB. They were originally modified in 1955 by the Fairchild Aircraft Co. in Hagerstown, MD, for aerial recovery operations; they were then delivered to Ogden Air Material Area in May 1956 and stored in that location for nearly nine months. Eventually, they were delivered to Hayes Aircraft in Birmingham, Alabama, for inspect and repair as necessary (IRAN), removal of recovery equipment and return to troop carrier configuration. In late 1957, all ten aircraft were transferred to various Air Force Reserve Units. After a very short tenure in the Reserves, they were transfered to Fairchild Aircraft Co. at St Augustine, Florida, for future modification and installation of approximately 2,300 lbs of recovery equipment. The aircraft were then delivered to the 6594 Test Group. The aircraft hours at this time, per unit, averaged about 2,000.[3]

C-119J Delivery/Transfer Dates

SN	Conf. FM:	Delivery Dates	Transfer Dates
51-8037	F	19 Sep 58	4 Dec 61

51-8038	F	4 Sep 58	4 Dec 61
51-8039	F	21 Aug 58	20 Jan 62
51-8041	F	Unk	4 Oct 61
51-8042	F	29 Aug 58	5 Dec 61
51-8043	F	27 Aug 58	24 Nov 61
51-8045	F	18 Sep 58	25 Jul 61
51-8049	F	11 Sep 58	19 Jan 62
51-8050	F	8 Sep 58	26 Jul 61
51-8115	F	25 Sep 58	25 Jul 61

On the average, the C-119s were assigned to the 6594 Test Group for approximately thirty two months. The aircraft were apparently phased out early because of its inferior performance compared with the C-130 Hercules. The C-130, had a basic speed 88 knots higher, a range 250 nautical miles greater and a cargo area of 538 square feet larger than the C-119. Thus, the C-130 was a clear choice over the relatively young but very outdated C-119.[4]

C-130/HH-53/H-3/H-21 Delivery/Transfer Dates

MDS	SN	Gain	FM	Lost	TO
C-130B	57-00526	May 60	AFLC	Jul 86	Hill AFB
C-130B	57-00527	Unk	Unk	Jul 86	AFR
C-130B	57-00528	Unk	Unk	Jul 86	ANG
C-130B	57-00529	May 59	PDN	Oct 84	AFLC
C-130B	58-00713	Unk	Unk	Jul 86	AFR
C-130B	58-00716	Jul 83	TAC	Mar 85	Hill AFB
C-130B	58-00717	Unk	Unk	Jul 86	AFR
C-130B	58-00750	Unk	Unk	Jul 86	AFR
C-130B	61-00962	Unk	Unk	Jul 86	ANG
HC-130H	64-14854	Unk	Unk	Jun 86	MAC
HC-130H	64-14857	Sep 65	AFLC	Jul 86	Hill AFB
HC-130H	64-14858	Unk	Unk	Jun 86	MAC
HC-130P	65-00992	Unk 74	MAC	Jun 86	MAC
HC-130P	66-00223	Unk 74	MAC	Jun 86	MAC
HC-130P	66-02225	Unk 74	MAC	Jun 86	MAC
CH-21B	51-15869	Apr 63	Unk	Dec 63	Unk
CH-21B	Unk	Oct 61	Unk	Dec 63	Unk

CH-21B	51-15872	Oct 61	Unk	Mar 63	*Terminated
CH-21B	Unk	Oct 61	Unk	Dec 63	Unk
HH-53C	68-10355	Jun 74	MAC	Jan 85	**Terminated
HH-53C	68-10356	Unk 74	Unk	Jun 86	MAC
HH-53C	68-10360	Unk 74	Unk	Jun 86	MAC
HH-53C	68-10367	Unk 74	Unk	Jun 86	MAC
HH-53C	69-05789	Unk 74	MAC	Jun 86	MAC[5]
HH-53C	68-10369	Unk 74	Unk	Jun 86	MAC
SH-3A	00-148040(Bu No)	Unk	Unk	Unk	Unk
SH-3A	00-148041(Bu No)	Unk	Unk	Unk	Unk
CH-3B	62-12571	May 62	Navy	Mar 78	MASDC
CH-3B	62-12573	May 62	Navy	Mar 78	MASDC
CH-3B	62-12574	Oct 62	PDN	Dec 74	Navy
CH-3B	62-12575	Nov 62	PDN	Dec 74	Navy
CH-3B	62-12576	Nov 62	PDN	Mar 78	MASDC[6]

C-130/HH-53 Background

Because of limited manpower, funds and the performance characteristics of assigned aircraft the following action was taken to modernize the 6594 Test Group Helicopter Fleet:

> Studies have shown that the Air Force could realize considerable cost savings by replacing the then current 6594th Test Group surface force of CH-3B aircraft and Surface Recovery Units with a helicopter force having an 800 NM radius of action. A proposal to use a more cost-efffective HH-53 helicopter/HC-130P tanker combination was analyzed.

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*CH-21B SN 51-15872 crashed at sea on 18 March 1963. The cause of the accident was attributed to a failure of the longitudinal control link assembly. The aircraft was subsequently terminated from the Air Force inventory. Although no documentation could be found, it appears CH-21B SN 51-15869 was assigned to the 6594th Test Group as a replacement for SB 51-15872.

** HH-53C SN 68-10355 crashed during a rescue mission on 15 Jan 1983. The aircraft was destroyed and subsequently terminated from the US Air Force inventory on 15 Jan 1985.[7]

and approved at HQ USAF. In September 1973, the Air Force Flight Test Center conducted feasibility flight tests with an HH-53 helicopter to provide qualitative, evaluation of the helicopter handling qualities, the dynamics of the load, and the helicopter-load interaction for simulated recovery conditions. No problems were encountered during these tests. After reviewing the study, HQ USAF released an availability schedule and an implementation plan was undertaken. Warner Robins Air Logistics Center (WRALC) was then tasked to develop the Surface Recovery System for the HH-53. The first aircraft was delivered to the 6594th test Group in June 1974, and the HH-53/HC-130P combination became operational in December 1974.[8]

Maintenance Effectiveness Aircraft Status

Definitions:

(a) An aircraft that cannot fly all of its missions is reported as partial mission capable (PMC) or not mission capable (NMC). To further explain the reason an aircraft is NMC or PMC, an additional letter is used, ie: By adding the letter "M" (Maintenance), "S" (Supply), or "B" (Both Maintenance and Supply).[9]

(b) Status reporting is a MAJCOM option for all aircraft possessed in BR (Major Maintenance, Awaiting Parts) CB (Combat Tactics Development and Equipment Evaluation) EB (Contractor, Test/Test Support) EH (Test Support) EI (Test) EJ (Ground Test) and ZA (Special Activity). The 6594 Test Group aircraft was possessed in, first EH and later ZA codes. HQ AFSC did not require the 6594 Test Group to report status.[10]

(c) The ability to fly unit missions is measured by the units capability to maintain equipment identified on minimum essential subsystems lists (MESLS). Since the command did not require status reporting, MESLS were not established. Thus, it is impossible to compare the aircraft status of the 6594 Test Group to any other squadron or command. However, the following sample status reports

should be used to determine the 6594 Test Groups approximate ability to accomplish their unique mission.[11]

The 6594 Test Group reported the following C-130/HH-53 yearly median mission capability rates for 1981 through 1985.

C-130

1981		1982		1983	
FMC	69.0	FMC	94.8	FMC	71.2
NMCM	16.1	NMCM	1.0	NMCM	9.2
PMCM	2.8	PMCM	.0	PMCM	3.2
NMCS	4.9	NM	3.3	NMCS	3.6
PMCS	7.5	PMCS	.9	PMCS	12.8

1984		1985	
FMC	76.7	FMC	76.1
NMCM	13.7	NMCM	17.1
PMCM	1.7	PMCM	.6
NMCS	4.1	NMCM	4.4
PMCS	3.8	PMCS	1.8

HH-53

1981		1982		1983	
FMC	59.1	FMC	97.9	FMC	81.8
NMCM	21.3	NMCM	.0	NMCM	14.1
PMCM	2.1	PMCM	.0	PMCM	.9
NMCS	15.0	NMCS	2.1	NMCS	1.7
PMC	2.5	PMCS	.0	PMCS	1.5

1984		1985	
FMC	80.4	FMC	75.4
NMCM	7.0	NMCM	23.0
PMCM	6.5	PMCM	1.6
NMCS	1.0	NMCS	.0
PMCS	5.1	PMCS	.0[12]

Maintenance, manpower and manning data forthe period before 1981 is not available. However, because of the increase in the number of assigned aircraft and the sophistication of the weapon system, it should be obvious that the assigned manpower and skill level increased dramatically with the delivery of the first C-130 aircraft. The following graphs depict maintenance manning for a one month period from 1981 through 1985. Data to show a yearly average or a specific month from each year is not available. The months shown vary from June to December. This, of course, does not show average yearly manning. However, the "snap-shot" data should provide an excellent overview and skill level of the final years of operation of the 6594 Test Group.[13]

Specific Maintenance Problems:

Aircraft corrosion prevention and treatment is an ongoing struggle, especially in a highly corrosive area like Hickam AFB. You can, however, prevent corrosion from progressing to a point that the aircraft must be grounded for repairs.

The 6594 Test Group did not have serious corrosion problems. This was do largely to a very vigorous corrosion prevention and treatment program. Over the years, the Test Group had several contracts with various corrosion prevention/treatment contractors such as the Aero Corporation in Florida, a (unidentified) facility in Taipei Taiwan, and finally Man-Pro in Oklahoma. The contractors performed IRAN (inspect and repair as necessary) type inspections. The contract with Man-Pro stipulated specific areas they were required to inspect and treat. Depending on the exterior condition of the aircraft, Man-Pro may have been required to paint the entire aircraft.

Although satisified with the work done at Man-Pro, the the Test Group terminated that contract and started to do their own corrosion control work at Hickam. Prior to terminating the Man-Pro contract the Test Group accomplished an extensive inspection of all assigned aircraft to determine their existing corrosion condition. Based on the results of this inspection and the age of the aircraft, the

1981

MAINTENANCE MANNING																					AS OF 31 DECEMBER 1981		
UNIT 6594 TEST GROUP																							
SKILL DATA	CHIEF OF MAINTENANCE			ORGANIZATIONAL MAINTENANCE			FIELD MAINTENANCE			AVIONICS MAINTENANCE			RECOVERY MAINTENANCE						TOTAL		
	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%
OFFICERS	3	3	100	1	1	100							0	1	N/A				4	5	125
"0" LEVEL	3	2	67	2	2	100							0	1	N/A				5	5	100
"7" LEVEL	18	14	78	23	21	91							7	10	143				48	4-	94
"5" LEVEL	6	13	217	94	67	71							24	20	83				124	100	81
"9" LEVEL	2	3	150	46	58	126							6	5	83				54	66	122
CIVILIANS	6	5	83	4	4	100							1	1	100				11	10	91
CHIEFS (CEM)	1	1	100	0	1	N/A							0	0	0				1	2	200
TOTAL	39	41	105	170	154	91							38	38	100				247	233	94

1982

MAINTENANCE MANNING																					AS OF 31 AUGUST 1982		
UNIT 6594 TEST GROUP																							
SKILL DATA	CHIEF OF MAINTENANCE			ORGANIZATIONAL MAINTENANCE			FIELD MAINTENANCE			AVIONICS MAINTENANCE			RECOVERY MAINTENANCE						TOTAL		
	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%
OFFICERS	3	3	133	1	0	0							0	1	N/A				4	4	125
"0" LEVEL	3	2	67	2	1	50							0	0	0				5	4	80
"7" LEVEL	15	14	93	26	24	92							8	8	100				49	46	94
"5" LEVEL	6	15	250	94	65	69							23	20	87				123	100	81
"9" LEVEL	2	4	200	43	67	156							6	9	150				51	80	157
CIVILIANS	6	5	83	4	4	100							1	1	100				11	10	91
CHIEFS (CEM)	2	2	100	0	0	0							0	0	0				1	1	100
TOTAL	36	45	125	170	161	95							38	39	103				244	245	101

1983

MAINTENANCE MANNING				UNIT 6594 TEST GROUP									AS OF 30 SEPTEMBER 1983								
SKILL DATA	CHIEF OF MAINTENANCE			ORGANIZATIONAL MAINTENANCE			FIELD MAINTENANCE			AVIONICS MAINTENANCE			Recovery Maintenance						TOTAL		
	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%
OFFICERS	3	3	100	1	1	100							1	1	100				5	5	100
CMS	1	1	100	1	1	100							0	0	0				2	2	100
[illegible] - 5 LEVEL	2	2	100	2	2	100							0	0	0				4	4	100
[illegible] - 7 LEVEL	18	16	89	31	34	110							10	11	110				59	61	103
[illegible] - 9 LEVEL	14	14	100	102	87	85							22	25	114				138	126	91
[illegible] - 5 LEVEL	2	5	250	51	57	112							6	5	83				59	67	114
CIVILIANS	6	6	100	4	4	100							1	1	100				11	11	100
TOTAL	46	49	107	192	186	97							40	43	108				278	276	99

1984

MAINTENANCE MANNING				UNIT 6594 TEST GROUP									AS OF 30 SEPTEMBER 1984								
SKILL DATA	CHIEF OF MAINTENANCE			ORGANIZATIONAL MAINTENANCE			FIELD MAINTENANCE			AVIONICS MAINTENANCE			Recovery Maintenance						TOTAL		
	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%
OFFICERS	3	3	100	1	1	100							1	1	100				5	5	100
CMS	1	1	100	1	0	0							0	0	0				2	1	50
[illegible] - 5 LEVEL	2	5	250	2	2	100							0	0	0				4	7	175
[illegible] - 7 LEVEL	18	13	72	27	32	119							10	11	110				55	56	102
[illegible] - 9 LEVEL	14	17	121	107	94	88							26	19	73				147	130	88
[illegible] - 5 LEVEL	2	2	100	49	50	102							6	3	50				57	55	96
CIVILIANS	6	5	83	3	3	100							1	1	100				10	9	90
TOTAL	46	46	100	190	182	96							44	35	80				280	263	94

1985

MAINTENANCE MANNING				6594 TEST GROUP									30 June 1985								
SKILL DATA	CHIEF OF MAINTENANCE			ORGANIZATIONAL MAINTENANCE			FIELD MAINTENANCE			AVIONICS MAINTENANCE			Recovery Maintenance						TOTAL		
	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%	AUTH	ASGN	%
OFFICERS	3	2	67	1	1	100							1	1	100				5	4	80
CMS	1	1	100	1	0	0							0	0	0				2	1	50
[illegible] - 5 LEVEL	2	2	100	2	3	150							0	0	0				4	5	125
[illegible] - 7 LEVEL	18	20	111	27	31	115							10	8	80				55	59	107
[illegible] - 9 LEVEL	14	16	114	107	98	92							26	20	77				147	134	91
[illegible] - 5 LEVEL	2	3	150	49	41	84							6	6	100				57	50	88
CIVILIANS	6	4	67	3	3	100							1	1	100				10	8	80
TOTAL	46	48	104	190	177	93							44	36	82				280	261	93

Test Group worked up a program that would provide the required corrosion prevention. In a subsequent meeting with all involved personnel it was determined that the corrosion control program could be accomplished in-house with existing manpower, provided the maintenance people were sufficiently trained to identlfy corrosion problems in its earliest stages when the repair was an easy one. For corrosion work beyond the Test Group's capabilities, they relied on PDM (Program Depot Maintenance) facilities.

Overall the Test Group had an excellent, viable corrosion/treatment program. To do this, they inspected two aircraft per month (after washing), during home station check and at least two per month during preflight or BPO (Basic Post Flight). Additionally, if an aircraft was going through an isochronal (ISO) inspection it too was inspected. If any corrosion was discovered, it was immediately repaired and or documented for additional repair or treatment.[15]

Supply Effectiveness

The 6594 Test Group Supply effectiveness is difficult to evaluate. As addressed in the maintenance effectiveness chapter, the Test Group did not establish mininum essential subsystem lists (MESL), thus local MESLs were used. This made comparable studies meaningless. However, considering the mission was assigned a 1-1 priority (highest USAF priority IAW AFR 27-15), and judging from samples taken from not operational ready supply (NORS) ratings, it appears supply effectiveness was not a major problem.

A monthly meeting was held by LGSMS in the 15 ABW Materiel Management Branch Office for joint review, analysis and discussion of appropriate actions deemed necessary to improve the supply support of project Crested Roster (code name for the 6594 Test Group Supply channel). Usually a representative from the 15 ABW/LGSM, 155 ABW/LGSMS, 6594 Test Group LGMCM, LGMRS/LGMRI and DORS attended. Normal agenda items were: items ordered/not received/back ordered, stock levels, fabrication items, procurement contracts, delivery schedule, test item specifications, estimated delivery dates, availability of spares, serviceable assets, modifications, critical shortage of serviceable assets, back order items, cannibalization actions, mission capable

(MICAP) requisitions etc.[16]

Although normal supply items did not appear to have caused major NORS downtime, the acquisition of workable flares (smokes) did create a major mission impairment. The Test Group's surface recovery operation relied on the MK-6 smoke. This flare was ideal for training because its forty minute burn time allowed for multiple deployment patterns or extended hover time to be flown without remarking the target. It also worked in the J-1 spotter chute for use as a wind drift device for parachuting operations. There were no documented problems with the MK-6 Smoke until the spring of 1981. At that time, the reliability of these smokes rapidly declined.

During May 1981, the Test Group submitted a material deficiency report (MDR) on the MK-6. The report stated that 21 percent of the smokes were defective. Hill AFB UT, quality assurance (QA) investigated the deficiency and reported their findings in June 1981. They estimated the reliability rate to be approximately 66 percent. They did not take any corrective action because of the impending ALC/MMWRA study to find a replacement for the MK-6.

In November 1981, ALC/MMWRA determined the replacement for the MK-6 would be the Navy MK-6 Model 3 smoke. Unfortunately, there were problems obtaining the MK-6 Model 3. Thus, in the interim, the LUU-10/B smoke was to be used. The LUU-10/B was not compatible with surface recovery operations. Additionally, it was not compatible with the J-1 spotter chute and it only provided twenty minutes of smoke. The test group had a substantial supply of the cheaper MK-25s which provided fifteen minutes of smoke. There was also a limited supply of the LUU-10/Bs available. Thus, instead of the LUU-10/B, the test group decided on the Navy's MK-58 as a replacement for the MK-6.

The MK-58 was compatible with the 6594 Test Group's operation. The MK-58 provided 40-60 minutes of smoke, was compatible with the J-1 spotter chute, and it was authorized in AFR 50-21 munitions allowance tables. In December 1981, the 6594 Test Group requisitioned these smokes from their munnitions supply (15 ABW/LGWK). They also requested an increased authorization of MK-58s from HQ AFSC/LGS. The 15

ABW/LGWK did not support the 6594 Test Group requisition because they felt the Navy technical data was insufficient for Air Force use. However, in May 1982, HQ USAF acknowledged the Test Group's requirement for the MK-58. They authorized the procurement of 100 assets from the Navy while they determined the needs of the rest of the Air Force.

By June 1982, HQ USAF had concluded that the 6594 Test Group was the only Air Force unit with a requirement for the MK-58s. Thus, they decided not to produce costly technical data for the handling and storage of the MK-58. They tasked the Test Group to establish an interservice support agreement with NAVMAG Lualualei Naval Reservation Oahu, HI, to provide this service, which was accomplished. They also increased the Test Group's MK-58 annual authorization to 900. The expected delivery date of the MK-58 was January 1983. When January 1983 came and went with still no MK-58s, the Test Group began inquiries about the status of the delivery. In April 1983, Air Force Satellite Control Facility (AFSCF)/RY informed the Test Group that delivery had slipped to September 1984. This was due to a shift in responsibility for the munition from the Navy to the Army. Because of this delay and with HQ AFSC authorization, the Test Group borrowed 200 more MK-58s from the Navy. They held these for mission use only.

The MK-6 Model 3 (which was a replacement for the MK-6) was finally procured for Air Force use. Unfortunately, the reliability of this smoke was extremely bad. The Test Group submitted another MDR in December 1983. The MDR stated that 45 out of 48 smokes completely failed to function while the remaining three functioned for only one minute each. The Test Group never received the results of the Hill AFB HQ's investigation of the MDR, but subsequent conversation with Hill AFB personnel indicated that the MK-6 is being modified for better reliability. The "Reworked MK-6" was to be available in one and one-half to two years. This of course did not aleviate the Test Group's immediate requirement.

The lack of reliable marine markers created many problems for suface recovery operations. The malfunctioning MK-6s were cited as the cause for losing one thousand

dollars worth of assets on a rescue mission and jeopardizing the lives of the pararescue jumpers (PJs). Jumpmaster training suffered because the students were deprived of the visual cue of the smoke on the water. The Test Group air refueling aircraft commanders (ARACs) did not get the benefits of flying multiple deployment patterns without remarking the target. Thus, the HH-53 pilots were unable to practice extended hover operations. The increased usage of the MK-25s created shortages which further restricted training. Additionally, there was also the increased cost in fuel and flying time used to fly the extra patterns required to keep the targets marked with the MK-25 smoke.

As of March 1985, the Test Group had 250 MK-58 smokes on hand. Unfortunately, the Navy was was also experiencing a shortage of these assets. The expected resupply of MK-85s has also slipped to September 1985. Although the problem was worked continuously for four years, it was never satisfactorily resolved. The Test Group felt that high level support to resolve this problem and to prevent a further degradation of their ability to accomplish their 1-1 priority mission was urgently required.[17]

In April 1985, HQ AFSC/LGM notified the 6594 Test Group that new production of the MK-58 flares had been accepted by the Army single point manager. The flares would be available for shipment in about one week. OO-ALC made arrangements for 2,086 MK-58 flares (minus the number for payback to the Navy) to be shipped to NAVMAG, Lualualei, for use by the Test Group. Due to the urgent need, the Navy requested air transportation.[18]

In May 1985, the Dir Mat Mgt, Hill AFB, UT, notified HQ AFSC/LGM and the 6594 Test Group that 200 MK-58 flares were to be shipped not later than 9 May 1985 (via MAC Air) and were to be on station at Lualualei by 15 May 1985. The balance of the MK-58 flares would be shipped via surface (unnamed vessel) with an estimated date of arrival of June 1985.[19]

On 18 June 1985, the 6594 Test Group notified the Dir Mat Mgt/MMWDCC that 200 MK-58 flares had been received at Lualualei and subsequently released for the Test Group's use. Additionally, the Test Group requested shipping status

on the remaining shipment. The message closed with a "thanks to all for your support." No documentation could be found showing the receipt of remaining MK-58 flares. However, interviews with crew members from the Test Group indicated the flares were received on schedule.[20]

The ninth (was the largest, final and considered the most successful) Crested Roster support conference was held 14 thru 17 April 1986 at Robins AFB, GA. Early deactivation of the 6594 Test Group came as a surprise to the Test Group. Because of this action, project codes 396 and 397 (requested codes for the Test Group) were terminated and all open items from the conference was considered closed.[21]

CHAPTER 3

NOTES

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18. HQ AFSC/LGM 091720Z April 1985, subj: MK-58 flares.

19. Dir Mat Mgt/MMW DCC 062135Z 2 May 1985, subj: MK-58 flares.

20. 6594 Test Group/DO 182320Z June 1985, subj: MK-58 flares.

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Security

Date: 30 Oct 89

Introduction

As described in Chapter One, the basic mission of the 6594th Test Group was to "develop and maintain the capability to effect the aerial and surface recovery of a capsule ejected from an orbiting satellite." This was their primary mission; it was the reason for the activation -- and eventually, deactivation -- of the Group.* Specially modified C-130 aircraft were used for aerial recoveries while surface recovery was conducted with HH-53 helicopters.**

Aircraft

For the bulk of their missions, the Test Group launched 19 aircraft. Ten JC-130 aircraft supported aerial recovery operations while nine aircraft supported surface recovery operations -- three C-130P tankers and six HH-53C helicopters. The ten JC-130s included seven JC-130Bs and three were JC-130Hs -- the H-models were somewhat newer and boasted large, external fuel tanks for extended range.[1]

Three major modifications converted a C-130 to a JC-130 -- installation of telemetry equipment, a winch and the aerial recovery set. Just aft of the aircraft flight deck, there were two electronic equipment racks. At those two positions, an electronic direction finding (EDF) operator and a telemetry

recording operator performed their functions. The EDF operator took electronic bearings on the descending capsule's two UHF beacons and provided a bearing to the pilot. The telemetry operator recorded the signals for later analysis.[2]

Aft of the TM and EDF positions were the console and winch that were the heart of the aerial recovery system. The recovery cable was wrapped on the winch drum inside a special cover and it rolled off the winch through the recovery dolly, much like a fishing reel. From his console position, the winch operator could control the reel-in of the capsule.* The recovery cable then passed from the winch, through the cargo compartment, through a protective shield in front of the dolly and finally back through the dolly boom. There, it attached to the recovery loop which extended below the aircraft. Located on the loop were hardened-steel hooks that engaged the parachute load-bearing lines and brought the capsule up to aircraft speed.[3]

If the aerial recovery was not successful or could not be accomplished for any reason, the primary surface forces took over. They consisted of six HH-53C helicopters and three C-130 escort tankers. The helicopters were similar to those used by the Air Force's Aerospce Rescue and Recovery Service and they had the typical rescue gear, large external auxiliary fuel tanks, aerial refueling system for extended range and the rescue hoist mounted by the crew entrance on the right side of the aircraft.[4]

Additionally, the aircraft had been futher modified for spacecraft recovery operations. To allow percise open-ocean navigation, the helicopters had an inertial naviation system -- the Delco Carousel IV -- similar to that used on most Boeing 747 aircraft. Due to the potential length of the recovery missions, a crew comfort area was placed aft of the pilot's compartment. It consisted of three airline-type seats and a small galley. Aft of the crew comfort area, a large auxiliary fuel tank was installed for extended range. Finally, at the rear of the helicopter, there was the surface recovry set mounted on the floor and could be moved fore or aft in the helicopter cabin. It consisted of a winch mounted on a plate on the floor which fed a line through the crane. At the end of the line was a hook. The hook was lowered below the helicopter to the pararescue specialists in the water who would attach the capsule to it. The capsule was then raised, settled into the cradle and then brought forward into the aircaft.[5]

As mentioned above, the Test Group's C-130P tankers were rescue-type aircraft with no special modification for recovery operations. Nevertheless, they were critical to the Test Group's mission. The size of the recovery area -- or ballpark -- was determined by the range of the helicopters. Without aerial refueling, they were limited to 300 nautical miles measured from the predicted impact point (PIP) to a suitable landing base. With the tankers and aerial refueling,

that range was extended to 675 nautical miles. (The larger radius represented the unrefueled return range from the PIP to the landing base. A mission range of 675 NM was based on three planned aerial refuelings outbound.)[6]

Recovery Control Center

All recovery operations were directed from the Test Group's Recovery Control Center, located in Hanger 2 at Hickam AFB. From the center console, the recovery task force commander -- normally the Test Group commander -- could monitor mission information and recovery event displays via a closed circuit television system and projections onto large screens in the front of the RCC. Assisting the commander was the mission coordinator who was the action officer on all preliminary planning. Approximately 45 minutes prior to the recovery, the mission coordinator would establish a hot-line to Sunnyvale and pass progress information to them. The Force Controller, meanwhile, maintained high-frequency radio contact with the on-scene aerial and surface recovery aircraft. The Assistant Force Controller coordinated airspace reservations with the Federal Aviation Agency and maintained communications with the tracking station at Kaena Point.[7]

External Support

Although remarkably self-sufficient, the Test Group worked with several other agencies. One of the most important was the Federal Aviation Administration, which provided airspace reservations. During recovery operations, the Group's crews required a large block of airspace to provide maneuvering room

for the JC-130s -- a block that would possibly cover the entire Hawaiian Island chain and have a serious impact on civilian air traffic coming to and from the Hawaiian islands. As a result, the Group worked closely with the FAA to minimize the impact on civilian flights while still meeting mission requirements. Furthermore, since Hickam AFB shared runways with Honolulu International Airport, the Group worked closely with them during flying operations.[9]

The Group also worked closely with several Navy organizations. The Fleet Training Group and Pacific Missile Range Facility managed vast ocean areas for military training and testing in the Hawaiian islands. When necessary, the Test Group could preempt the training areas; however, they worked closely with the Navy to minimize the impact on their operation. The Naval Western Oceanography Center, meanwhile, provided twice-daily sea status reports for the intended recovery area. This information was vital in the event that surface recovery became necessary. Finally, the Navy also provided a secondary surface recovery capability. In the event the Group's helicopters could not support a recovery attempt -- i.e. the ballpark was too large as the result of a spacecraft malfunction -- the Navy provided surface vessels to cover the intended recovery area and assist in surface recovery operations.[10]

The Group received significant assistance from several organizations at Hickam AFB. The host unit, the 15th Air Base Wing, provided normal base-level support as well as intermediate aircraft maintenance support. (The 15th ABW provided more than 200 positions dedicated to Test Group support in avionics, sheet metal and jet engine repair.) The 1957th Communications Group maintained the Group's remote radio equipment at Wahiawa and Bellows as well as the cryptographic gear in the Test Group's communications center. The Defense Meteorological Satellite Program (DMSP) to provided satellite photos for the Group's weather forecasts. Detachment 3 of the 1363rd Audiovisual Squadron provided photographers and equipment for documenting mission recoveries and recording training recoveries.* Finally, Detachment 4 of the 20th Weather Wing provided personnel and equipment for weather observation and analysis.[11]

Since the recoveries were strictly visual maneuvers, the Group relied heavily on accurate weather forecasts. Assisting the forecaster were two types of weather satellites -- polar orbit and geostationary. The polar orbit spacecaft included the DMSP as well as National Oceanographic and Atmospheric Agency spacecraft, NOAA 6 and NOAA 7. They made 14 revolutions of the earth each day at an average altitude of 445 nautical miles. The geostationary soruces were GOES east and west as well as the Japanese meteorlogical satellite. These

spacecraft maintained a stationary position 22,000 miles above the earth and rotated with it, providing a constant image of the same area. Det 4 also provided an observer for the weather reconnaisance aircraft which flew into the intended recovery area to recommend a Go or No-Go decision or change of location.[12]

With the exception of the communications sites discussed above, all Test Group facilities were located at Hickam AFB. They included Hanger 2, which housed the RCC as well the the commander and staff offices. Additionally, most of the operations division personnel were also located in Hanger 2. The pararescue forces had their office areas and equipment storage in Hanger 7. The logistics division and recovery systems branch were located in hangers 11 and 13. The Group also had a nose dock building on the flight line for C-130 maintenance. They also had a dedicated parking location for their aircraft, which was enclosed in a restricted area as the Group's aircraft were considered priority "B" resources. The Test Group was not the only flying organization at Hickam AFB and there were a large number of other aircraft on base; however, it was the largest flying unit.[13]

Depending upon the type of capsule, it would deploy either a Mark 5 or Mark 8 parachute. The Mark 8 system was used for capsules weighing on the order of 1100 pounds. Loadbearing lines extended from the capsule up through the parachute canopy and into a conical extension on top of the parachute. The loadbearing lines were engaged by the recovery hooks to bring the system up to aircraft speed and on board. The distance from the bottom of the capsule to the top of the conical parachure extension was approximately 100 feet -- the cone itself was 15 feet tall. The main parachute canopy was 40 feet in diameter. Since it was too large to fit into the recovery loop, the conical extension was added, and at 12 feet in width, it fit easily into the loop. (By comparision, the C-130 was 98 feet long.) The Mark 5 parachute supported lighter recovery capsules and was also used extensively during the training of RACs. The Mark-5 system was cheaper and easier to handle and repack. After a 4-6 month training program using the Mark-5 system, a RAC in training would enter a transistion phase to familiarize himself with the Mark 8 system.[19]

Once the capsule was sighted, the RAC designated as the primary recovery pilot conducted a fly-by to inspect the

capsule and insure the parachute and cone had deployed properly. With the descending system in view and stabilized, the C-130 was slowed, and at about 20,000 feet the aircraft was depressurized. The rear ramp was opened and the aerial recovery set was extended. The riggers extended and lowered the poles into their recovery configuration. Once the aerial recovery set was rigged and ready, the RAC maneuvered to make a recovery pass on the system at about 15,000 feet. He flew directly toward the recovery system, allowing the aircraft to lose altitude, matching the parachute's descent. Passing slightly over the cone, the JC-130's recovery hooks would engage one of the loadbearing lines of the parachute. The computer-controlled winch played out the cable to maintain a preset tension while bring the system up to aircraft speed. When the system was in tow and stabilized, the winch operator reeled it aboard. After the capsule was safely aboard the aircraft, the recovery rig was retracted, the aircraft repressurized and it returned to Hickam.[20]

The surface recovery forces were the last to launch. They consisted of HH-53C helicopters and a primary C-130P tanker. The tanker provided aerial refueling and escort for the helicopters on their way to and from their on-station position. The last aircraft to launch was the secondary tanker which would climb to altitude, maintain its best cruise for fuel conservation, and remain available in the event the primary

tanker had a mechanical problem or ran low on fuel and had to return to Hickam before the mission was complete. The secondary tanker also escorted the helicopters home after the mission. The HH-53C helicopters began surface recovery operations by completing a mid-air refueling to obtain a required load of fuel. Each aircrew member then completed a specific pre-recovery checklist: The pilots checked engine power and systems for a long, over-water hover; the flight mechanics checked the rescue hoist and surface recovery system; and the pararescue specialists donned their wetsuits, tanks and other mission equipment. Once the system was located in the water, its position was marked with smoke flares. The flares helped assure visual contact with the system and also provided a visual wind indicator for the helicopter pilots as they flew in for pararescue specialist deployment. At about ten feet and ten knots, each of the helicopters deployed a pararescue team -- two helicopters, one team on each -- a total of four men in the water. The surface recovery system operator moved the set the the aft ramp once the helicopter was in a hover. In the water, each pararescue team had a specific task. The team from the first aircraft was responsible for preparing the capsule for pickup while the other team was responsible for preparing the mission parachute. Once the capsule and parachutes were ready, the pararescue crews signaled the helicopters. The pilot of the first HH-53C achieved a hover directly over the capsule and the

pararescue team would engage the hook of the surface recovery set. After making the hookup, the pararescue team swam forward to the rescue hoist and were hoisted aboard the helicopter. Once the PJs were safely aboard, the recovery system operator began hoisting the capsule out of the water. The process was then repeated for the parachute. Once the capsule and parachute were secured aboard the helicopters, the recovery force returned to Hickam.[21]

If the Group's helicopters could not support a mission, the Navy provided a backup surface recovery capability. Once the recovery system was located, four pararescue men would jump from a JC-130 and prepare the capsule and parachute. The Navy ship -- normally a salvage vessle, however, destroyers were also used -- would steam to the capsule, sometimes taking two or three hours to arrive. The pararescue team place a flotation collar around the capsule and enter life rafts until the ship arrived. (As part of a security system, the recovery capsules had errodable plugs which would disintegrate after a period of time in the water, causing the capsule to sink.) Once the ship arrived in position, it would use a crane to hoist the capsule aboard and stowed in a specially designed cradle. Also on board the ship was a Test Group officer, usually a helicopter pilot, who ensured the proper procedures were followed during handling of the capsule.[22]

Secondary Missions

The Test Group possessed a unique combination of highly trained aircrews, specialized equipment and mission support staff. Frequently, the Group was asked to apply these assets to support other organizations and activities. As a result, in addition to their primary responsibility of recovering deorbited capsules from Department of Defense spacecraft, the men and women of the Test Group supported a number of other recovery operations.* Occasionally, these taskings were relatively simple -- such as providing transportation for visiting dignitaries; flying HH-53C and HC-130P missions supporting Military Airlift Command's Cobra Judy radar identification tests; helping ferry Navy TA-4 aircraft; demonstrating aerial refueling techniques with Army CH-47 helicopters; and demonstrating aerial recovery techniques to a team from the National Aeronautics and Space Administration's Wallops Flight Facility. (The Wallops facility recovered research payloads weighing between 5 and 350 pounds and wanted to view the Test Group's work with heavier payloads.) Other "secondary" missions required extensive planning and preparation. At the time of the Group's deactivation, the 6594th crews were supporting a number of secondary missions including the Air Force Geophysics Laboratory's Stabilized High Altitude Research Platform; the U.S. Army's Designating Optical Tracker which was launched from

the Kwajalein missile range to intercept an inbound ICBM launched from Vandenberg AFB; and flew sea and land surveillance missions supporting law enforcement agencies.** [23]

Furthermore, since they possessed a unique aerial recovery capability, the Test Group crews were required to develop and test their recovery equipment and they continually refined their recovery techniques. Originally, this was performed by Detachment 1 of the Air Force Satellite Control Facility, located at Edwards AFB, California. Later, this function was incorporated into the Group's Test Engineering Branch at Hickam AFB. Additionally, members of the Group frequently spend numerous hours testing and evaluating alternate recovery equipment and techniques including the heads-up display (HUD), various parachute configurations and alternative surface recovery techniques.[24]

Biosatellite

One of the first "secondary" missions supported the National Aeronautics and Space Administartion's Biosatellite project. In the early sixties, scientists did not know what affects space travel would have on living organisms -- and this needed to be clearly determined before sending men into space. Biosatellite was the pioneering effort to conduct biological scientific experiments in space. A series of orbital flights

were designed to determine the effect of weightlessness, and in some instances combined weightlessness and controlled radiation, on a variety of biological specimans. They started with relatively primitive life forms such as amoeba, pepper plants, frog eggs, mold, bacteria, beetles, seedings, plants and fruit flies and culminated with a primate.[25]

The Test Group's role in the Biosat program was to recover the capsules. Although by this time, the recovery procedures were relatively well-defined, working with NASA did present some additional challenges -- as the Air Force Satellite Control Facility would again discover when working with the Space Transportation System. The most obvious disparity was in the dissemination of information. Bob Lindsy of the San Jose Mercury News reported, "Space officials face a sticky problem in decidinlg how to deal with the public over an upcoming space flight that combines science and secrecy. . . .[Test Group] exploits were well publicized until March, 1961, when Secretary of Defense Robert McNamara personally ordered all publicity to cease about the unit and its parent operation at Sunnyvale.... By NASA's Congressional charter, the Space Agency must conduct all operations in full view of the world." NASA resolved the 'delema' by publishing a security classificattion guide which restricted release of specific recovery information such as the primary force composition and deployment, communications, coded events summary and the actual recovery sequence.[26]

The first BioSat mission was launched from the Eastern Test Range on 14 December 1966 and flew a three-day mission; however, it failed to deorbit and reenter as planned. After more than two months of unsuccessful search by both United States and Austrailian forces, the capsule was considered lost. Nevertheless, there was significant outcry from the Australian press about the dangers of irradated insects landing in their country.[27]

Recovery of Biosat II was as planned at 6° 55' N and 162° 10' W, an estimated 15 miles from the predicted impact point. The aircraft interior was maintained at 16° C on the flight to the laboratory at Hickam AFB and disassembly was begun in the air-conditioned trailer laboratory at Hickam AFB 3 1/2 hours after retrival.[28]

The final flight was launched from Patrick AFB on 29 June 1969. This was a primate mission and was scheduled for 30 days; however, telemetry indicated that "Bonnie" refused to consume water after 2100Z on 6 July 1969 and experienced a lowered body temperature, reduced heart-beat rate, shallow breathing and substantial periods of sleep. NASA decided to call down the spacecraft for reentry the following day. The capsule overshot the predicted impact point, however, the recovery aircraft acquired the capsule's beacon. Subsequent readings confirmed the capsule had overshot the predicted impact point -- by 173 miles. Shortly thereafter, visual sightings

were reported and air-recovery procedures began; however, the first aircraft on the scene broke a hook retainer which prevented deployment of the aerial recovery set. A second aircraft arrived and began a 15-second recovery pattern, but the capsule descended into clouds at approximately 6,000 feet -- 10 seconds before contact could be made. The low cloud base (1,000 feet) and poor visibility (less than 1 mile) precluded further attempts at aerial recovery. Splash was observed at 2241GMT and the impact point was marked by smoke and sea dye immediately. Intermittent rain showers prevented attachment of a balloon station for water-to-air retreival; and a CH-3B helicopter recovered the capsule from the water at 2344Z. They flew directly to Hickam and returned the capsule to NASA scientists at 0041 GMT.[29]

Ash Can

The department of Energy and the Air Force Geophysics Laboratory were tasked to collect whole air and particulate debris samples from the atmosphere. Their project, Ash Can, used balloons to float experimental packages and scientific sampling equipment at predetermined altitudes in the airspace over Alaska, Panama and the Southwest United States.* Once sampling was completed, a radio command separted the experimental package from the balloon and destroyed

the balloon. The payload descended on parachute for aerial recovery. The Test Group began supporting Ash Can missions with a deployment to Alaska on 15 May 1964. They subsequently supported missions from Panama and Brazil. In January 1967, the Test Group suspended Ash Can support as the Aerospace Rescue and Recovery Service assumed that responsibility. However, in 1979, the Group resumed Ash Can support -- the result of a Military Airlift Command initiative "to reduce the inefficiencies of two commands performing similar missions". The Test Group resumed Ash Can support with nominal results.[30]

Rescue Activities

Although it was not part of their official mission, the men and women of the Test Group frequently participated in a variety of rescue missions. Test Group crews felt so strongly about this, that many (particularly the pararescue specialists) voluntarily practiced and refined their life-saving skills on their own time. Nevertheless, sometimes superb training and preparation were not enough. Thus it was on 15 January 1985, during a rescue mission, one of the Test Group's HH-53C helicopters crashed, killing seven crew members aboard the flight, designated Arris 01.* Killed were: Captains David O. Mason and Stephen Pindzola; Second Lieutenant Russell H. Ohl; Staff Sergeants John R. Gilbert, Kyle D. Marshall and Daniel R.

Reihman; and Sergeant Robert A. Jermyn. Undersecretary of the Air Force Edward C. Aldridge Jr expressed his personal sorrow and added, "The Air Force is truly proud of these crewmembers and the sacrifices that have made for their fellow-men. They are true heroes."[31]

The vast majority of rescue support in the Hawaii area was provided by the Coast Guard and Navy. However, the Test Group had several unique resources. The pararescuemen (PJs) were trained medics, scuba divers and parachute jumpers and could provide medical aid under circumstances which would normally have been impossible. Furthermore, the HH-53C helicopters and their associated aerial refueling support allowed the Group to support operations more than 500 miles from land -- the other services were limited to less than 100 miles and they had no PJs. The Test Group supported search and rescue operations as well as medical evacuation (medevac) on a non-interference basis with its primary mission. Resources were committed only in bona fide life-threatening emergencies as confirmed by a qualified medical personnel and the Honolulu Joint Rescue Coordination Center.[32]

* During its history, the Group went through a number of name and organizational changes. For purposes of clarity in this chapter, references to the Group or Test Group or 6594th, etc automatically include the 6593rd Test Squadron and Recovery Control Group, as appropriate.

** Originally, C-119s were used for aerial recovery and there was no organic surface recovery capability. Eventually, the Group received CH-3 and later the HH-53 helicopters. See also Chapter III.

1. Pub (S-OADR), 6594TG OPLAN 1-84, Recovery Operations (U), 1 Sep 84.

2. Pub (U), T.O. 1C-130(J)B-1, Partial Flight Manual, JC-130B, JC-130H and HC-130B, 4 Oct 84.

* The winch had a breaking mechanism which allowed the capsule to accellerate slowly to match the recovery aircraft's speed. Early versions of the recovery system looped the recovery cable in a trough with cords attached. The cords were designed to break, absorbing the impact forces.

3. Pub (U) T.O. 13D-1-2-2-2, Aerial Recovery Equipment Subsystem P/O, Space Vehicle Aerial Recovery Set, Type A/A37U-14, 15 Jun 68; Pub (U), Aerial Retrival System, 6594TG, Feb 80; Pub (U), T.O. 1C-130(J)B-1, Partial Flight Manual, JC-130B, JC-130H and HC-130B, 4 Oct 84; and Pub (U), 6594TGP 51-3, Aerial Recovery Specialist (Rigger) Lesson Plan Guide, 6594TG, 1 Dec 84.

4. Pub (U), T.O. 1C-130(J)B-1, Partial Flight Manual, JC-130B, JC-130H and HC-130B, 4 Oct 84.

5. Pub (U), HH-53C Helicopter Maintenance Officer Course, 6594TG/LG, c. Feb 85; and Pub (U), T.O. 1H-53(H)B-1, Flight Manual, HH-53B, HH-53C and CH-53C Helicopters.

6. Pub (S-OADR), 6594TG OPLAN 1-84, Recovery Operations (U), 1 Sep 84.

7. Pub (U), SRO OI 11-1, Mission Coordinator/Day Duty Officer's Responsibilities, 6594TG/SR, 31 Jul 84; and Pub (FOUO), Operating Instructions for the USAF Recovery Control Center, 6594TG, 1 Jan 73.

8. Pub (FOUO), Operating Instructions for the USAF Recovery Control Center, 6594TG, 1 Jan 73.

9. Pub (S-OADR), 6594TG OPLAN 1-84, Recovery Operations (U), 1 Sep 84.

10. Pub (U), SRO OI 11-1, Mission Coordinator/Day Duty Officer's Responsibilities, 6594TG/SR, 31 Jul 84.

* (U) The training recovery films were particularly important for the recovery aircraft commanders -- RACs-- since the aerial recovery was strictly a visual maneuver. The training films were used extensively by the RACs to detect and correct any ineffective techniques. Poor performance during a training mission would cause a RAC to be removed from the recovery lineup.

11. Brfg (S-OADR), 6594th Test Group Mission Briefing (U), Maj J.R. Stoneberger, AFSCF/RY, Feb 85.

12. Brfg (S-OADR), 6594th Test Group Mission Briefing (U), Maj J.R. Stoneberger, AFSCF/RY, Feb 85.

13. Pub (U), SRO OI 11-1, Mission Coordinator/Day Duty Officer's Responsibilities, 6594TG/SR, 31 Jul 84; and Brfg (S-OADR), 6594th Test Group Mission Briefing (U), Maj J.R. Stoneberger, AFSCF/RY, Feb 85.

14. Brfg (S-OADR), 6594th Test Group Mission Briefing (U), Maj J.R. Stoneberger, AFSCF/RY, Feb 85.

15. Pub (S-OADR), 6594TG OPLAN 1-84, Recovery Operations (U), 1 Sep 84.

16. Brfg (S-OADR), 6594th Test Group Mission Briefing (U), Maj J.R. Stoneberger, AFSCF/RY, Feb 85; and Pub (S-OADR), 6594TG OPLAN 1-84, Recovery Operations (U), 1 Sep 84.

17. Brfg (S-OADR), 6594th Test Group Mission Briefing (U), Maj J.R. Stoneberger, AFSCF/RY, Feb 85; and Pub (S-OADR), 6594TG OPLAN 1-84, Recovery Operations (U), 1 Sep 84.

18. Brfg (S-OADR), 6594th Test Group Mission Briefing (U), Maj J.R. Stoneberger, AFSCF/RY, Feb 85; and Pub (S-OADR), 6594TG OPLAN 1-84, Recovery Operations (U), 1 Sep 84.

19. Pub (U), 6594TGR 55-1, Vol I, Flying Operations, 15 Mar 85.

20. Pub (FOUO), Operational Procedures for Special Programs, 6594TG, c. Mar 76; and Pub (U), 6594TGR 55-1, Vol I, Flying Operations, 15 Mar 85.

21. Pub (U), T.O. 1H-53(H)B-1, Flight Manual, HH-53B, HH-53C and CH-53C Helicopters; Pub (U), 6594TG Supp 1 to AFSCM 55-1, Vol XI, Helicopter Aircrew Training, 15 Jul 85; Pub (U), 6594TGR 55-1, Vol I, Flying Operations, 15 Mar 85; and Pub (S-OADR), 6594TG OPLAN 1-84, Recovery Operations (U), 1 Sep 84.

22. Pub (U), SRO OI 11-1, Mission Coordinator/Day Duty Officer's Responsibilities, 6594TG/SR, 31 Jul 84; Pub (U), 6594TGR 55-1, Vol I, Flying Operations, 15 Mar 85; and Pub (S-OADR), 6594TG OPLAN 1-84, Recovery Operations (U), 1 Sep 84.

* The following discussion is not an exhaustive review of these missions; rather it is designed as a representative review. Some of the "secondary" programs are not addressed due to security limitations; others are not included simply because of the scope of this project and the resultant limits of time. Nevertheless each of the programs was important and deserves thorough coverage at some future time.

** A general description of these operations is contained in the periodic AFSCF histories.

23. Hist (S/RD), Air Force Satellite Control Facility, Oct 83 - Dec 85, pp 163-167. Material used: (U)

24. Hist (S/RD), Air Force Satellite Control Facility, Oct 83 - Dec 85, pp 163-167. Material used: (U)

25. Pub (U), Biosatellite project Historical Summary Report, NASA Ames Research Center, Dec 69.

26. TOO (FOUO), Biosatellite Program, AFSCF, 21 Mar 69; Art (U), "Science, Secrecy in Conflict for Biosatellite Mission," San Jose Mercury News, 18 Sep 66; and SCG (FOUO), Project Biosatellite, NASA Ames Research Center, 20 Mar 67.

27. Rpt (FOUO), Operation Lost Ball (NASA Biosatellite I) Final Report, AFSCF, 3 May 67.

28. Pub (U), Biosatellite project Historical Summary Report, NASA Ames Research Center, Dec 69.

29. Ltr (S-OADR), Col C.E. Hughes, AFSCF/SMOTV, to AFSCF/SMO, "SCF Operations Evaluation Report (U)," 13 Aug 69; and Pub (U), Biosatellite project Historical Summary Report, NASA Ames Research Center, Dec 69.

* (U) The program received the name from the shape of the clynderical recoverable systems which looked like an ash can.

30. Hist (FOUO), 6593 Test Squadron, Jan-Jun 64, p 6; Hist (FOUO), 6593 Test Squadron, Jan-Jun 67, p 2; Hist (FOUO), 6594 Test Group, Jan-Jun 67, p 9; ARRS OPPLAN 9511 (FOUO), Ashcan, 15 Jul 76; Ltr (U), MGen R.F. Cloverdale, MAC/XPPP(X), to Hq USAF/PAX, et al., "Transfer of the HC-130 Air-to-Air Recovery (ATAR) Mission," 13 Mar [illegible]; and Ltr (U), Maj R.E. Cherry, 6594TG/DO, to 659[illegible]G/LG, et al., "ASHCAN Project Trip Report," 26 Mar 8[illegible].

Ed Note: Tim, I'd liked to have included the numbers on Ash Can, but they were widely scattered and rather than giving an inaccurate figure, I avoided the issue.

* (U) Details of the accident are contained in Rpt (FOUO), Class A Flight Mishap, HH-53C, SN 68-10355, 15 Jan 85, filed CSTC/HO.

31. Hist (S/RD), Air Force Satellite Control Facility, Oct 83 - Dec 85, pp 166-167. Material used: (U)

32. Pub (FOUO), Operating Instructions for the USAF Recovery Control Center, 6594TG, 1 Jan 73; Pub (U), SRO OI 11-1, Mission Coordinator/Day Duty Officer's Responsibilities, 6594TG/SR, 31 Jul 84; Pub (U), 6594TG Supp 1 to AFSCM 55-1, Vol XI, Helicopter Aircrew Training, 15 Jul 85; and Pub (U), 6594TGR 55-1, Vol I, Flying Operations, 15 Mar 85.